Successful Methods

A Monthly Pictorial of Field Practice and Equipment

GENERAL CONSTRUCTION — HIGHWAYS — BUILDINGS
ENGINEERING — INDUSTRIAL

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Hitting the High Spots

THE gentlemen who have been inviting you to subscribe to *Successful Methods* doubtless have been telling you about our monthly tour through the construction field for less than three cents per trip. In these days when the good old five cent fare has almost disappeared from the face of the land, that sounds like a rather large order, so before going further perhaps it would be worth while to glance through this page to get some idea as to how we are making out.

The usual trip starts in leisurely fashion, but a trip through the construction field for three cents isn't usual. Before this one is fairly under way it takes a record breaking whirl around an automobile speedway with the Juniata Company of Philadelphia. Nobody expects speed to come out of Philadelphia, but a look at pages 4, 5, 6, and 7 may dispel that idea. No job described in *Successful Methods* in the last six years has been so speedily done. The old army theory that the way to get anything done quickly is to put a couple of regiments of men to work is knocked into a cocked hat by the Juniata Company. "Machines, not men" is the Juniata slogan.

If your curiosity has been aroused by the smoke on the cover, stop off at pages 8 and 9 and find the fire. It's a red hot thriller from California with a brave little ditcher playing the lead.

A couple of nasty overnight jumps will take you to Boston (pages 10 and 11) to see Mr. Statler's new hotel which is going up calmly and serenely (that's the whole point of the story) on the very spot where the British troops set out for Lexington and all other Revolutionary points; and back to Kansas to watch the Haskell Indians put up a new stadium for their football team. (Pages 12 and 13.) Some of the Indians, not content with subscribing their money to build the stadium, went to work for the contractor who is putting it up, and so got some of their money back. Look at the pictures and see if you can see any Indians. We couldn't.

Have you ever been hit on the head with a brick bearing on its rubicund face the mystic letters J. J. J. If you have, you will be interested in the article on pages 21, 22, and 23, which tells how the Jova brothers are running an up-to-the-minute brick plant up the Hudson River near Newburgh.

Bear left at page 24 and look over the job which the B-W Construction Company of Chicago is doing for Sears Roebuck, way down in Atlanta. These B-W people (does anybody know what B-W stands for?) have installed a tunnel and conveyor system that gives the sand and slag a regular scenic railway ride on their way to an untimely end in the mixer's rapacious maw.

England and Peru are visited in the next two or three pages. These foreign articles always give us a chance to see how much better we do things than our brothers across the sea, and every now and then we discover that we don't.

If you are not afraid of wet feet, paddle around a few minutes in the Jersey marshes with the boys of the Shapiro Construction Company (pages 34, 35, 36). They are building a road for the New Jersey Highway Department and a good share of the time they are in mud and water right up to their necks. Whenever it rains they have to rush for dry land to escape drowning. They are doing a good job that is well worth reading about.

A Texas road job, a glance at the way in which the State of New York is spending its bond issue money, and a side trip to Bermuda to see how a portable compressor works with gas costing fifty cents a gallon coursing through its veins, plus a visit to the docks conclude this month's trip.

We almost forgot the all picture pages. Don't skip them. You can compare the technique of the President with that of Mrs. Coolidge at the difficult art of well and truly laying a cornerstone. You can visit jobs in Germany, Florida, Japan and other places hither and yon, all on your three cent ticket.

Construction Gains

© P. & A.

Mrs. Coolidge expertly spreads the mortar for the cornerstone of the new Y.W.C.A. building in Washington

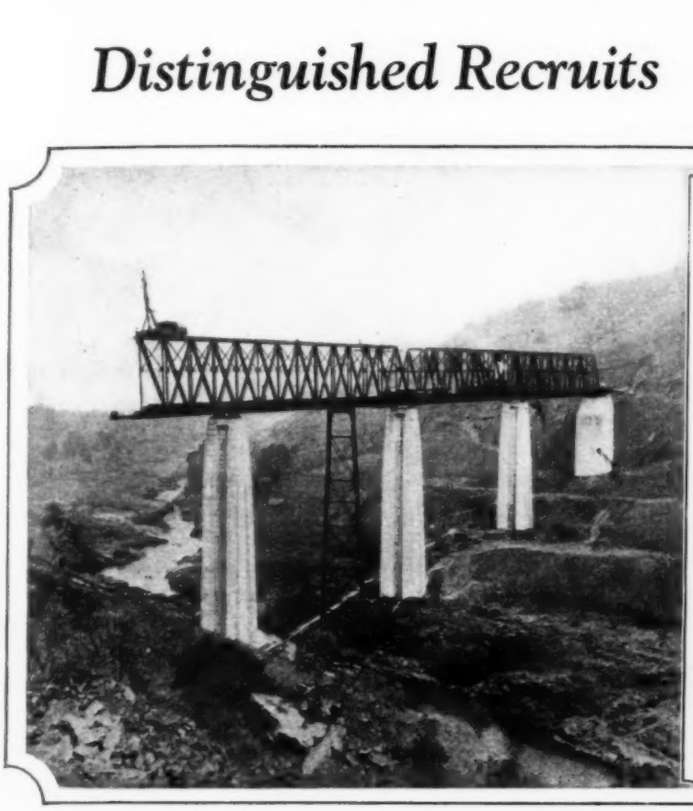
© International.

The Schuylkill River has been turned into a new channel at Port Clinton, built by the engineers of the Reading Railroad. A photograph of the blasting operations appeared in the October, 1925, issue of *Successful Methods*

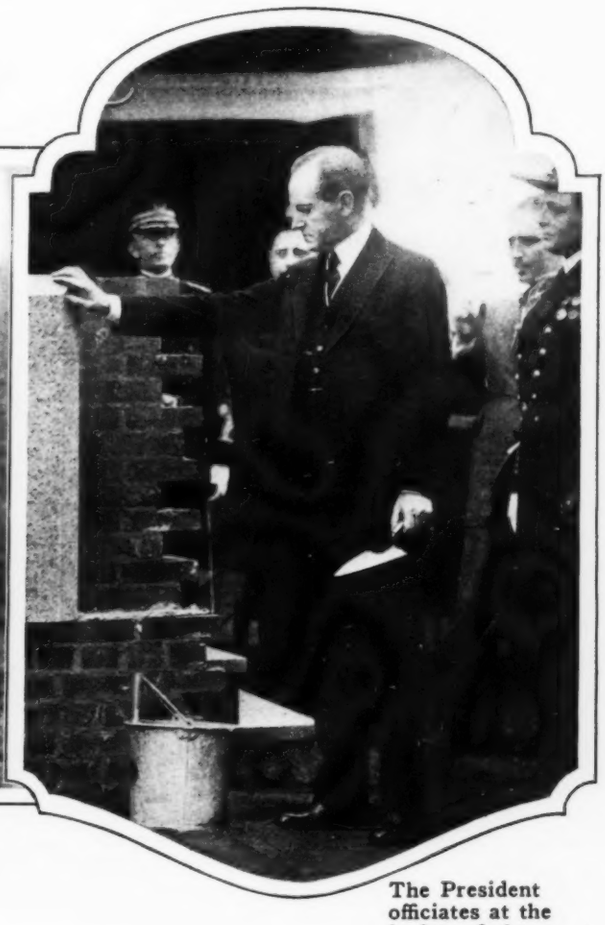
Primitive methods of earth handling still are used in Japan. Ditches have been repaired in this manner for centuries

©P. & A.

Distinguished Recruits



One of the bridges made necessary by the construction of the Exchequer Dam in California. This structure will cross the Merced River 300 ft. above the present level of the water



The President officiates at the laying of the cornerstone of the National Press building at the Capital

In contrast to the photograph at the bottom of the opposite page with its large number of workmen is this picture of making land by machinery. It was taken in Florida, near Tampa

Fast Work on a Mile Track

Philadelphia Contractors Put the Speed in Speedway With Aid of Modern Construction Machinery

THE words "speed" and "racetrack" are such close friends that it ought not to be surprising to find that one of the speediest construction jobs done in a long time is the building of an automobile race track. The Philadelphia Speedway Corporation awarded on April 9 last to the Juniata Company of Philadelphia a contract for the building of a 1-mile dirt track 60 ft. wide with a provision that it was to be ready for racing on Memorial Day.

The site of the track is at Langhorne, Pa., on the Lincoln Highway, about 20 miles from Philadelphia, and when the Juniata Company moved in on Monday, May 12, there was nothing in sight but a fairly level tract of land, one corner of which was rather heavily wooded. Work began at once, a Northwest crane and a Western elevating grader being the first machines on the job. The crane arrived Sunday afternoon, having finished a job the other side of Philadelphia at 10 o'clock Saturday evening. The grader was brought all the way from Harrisburg. R. C. Jacob, president of the Juniata Company, had heard from one of his shovel men that an elevating grader had been working near Harrisburg, so he got on the telephone and found that he could get hold of it. A crew left for Harrisburg with a truck at 3 o'clock Saturday morning and were back with the grader on Sunday night.

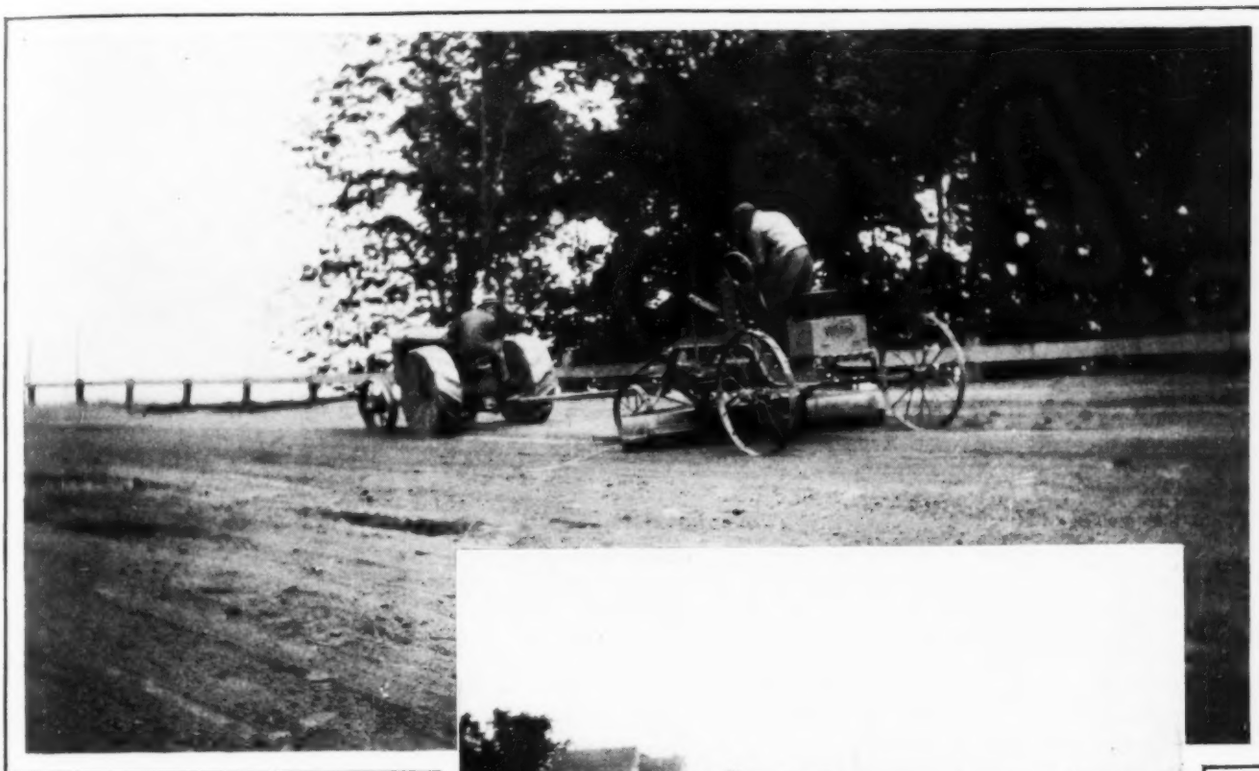
The two machines settled down to work bright and early on Monday morning. The crane, which was equipped with a ¾-yd. clamshell bucket, started on a complete circuit of the track digging the earth away at the pole and casting over to form the outer rim of the track and to give it the proper banking. The grader, hauled by a Caterpillar tractor, followed along doing its share of the work. These two machines did most of the heavy earth moving on the entire job and it was their efficiency of operation that made it possible to complete the work on time.

By the time the crane and grader were well on their way around the track, two 10-ton steam rollers and a 5-ton gas roller had arrived. A Western patrol grader hauled by a Fordson tractor and two Weir graders also were put on the job to help in the work of finishing the surface. It took the crane about two weeks to make one complete circuit of the track but before it reached the corner where the woods were, considerable work had to be done. The track, as laid out, went directly through the woods for about 500 ft. In addition to removing about 300 trees, it was necessary to make a 7-ft. fill on this portion of the track. Dynamite was used for getting out the stumps before the crane reached that section.

When the Philadelphia papers printed the news that a new automobile race track was to be built in so short

W. W. McCray, superintendent, is shown sitting on the fence with his boss, R. C. Jacob, president of the Juniata Company, looking admiringly at him

The photograph below was taken from the grandstand the day before the first races were held on the track



The patrol grader shown above made more circuits of the track in the last few days than it was possible to count

The 5-ton gas roller is shown at the right, rolling the incline to the tunnel under the track

a time, the public jumped at the conclusion that the only way to accomplish the desired result would be to put a large number of men to work. For the first few days, the Juniata Company's office was overwhelmed with applications from laborers, but so efficiently was the work organized that only about 30 men were employed on the job and these men were taken from the company's regular force. It was a machine job from start to finish.

Most of the photographs which illustrate this article were taken a day or two before the track was completed and show the various machines hard at work putting on the finishing touches and getting the track ready for the first races which were held May 30 according to the original schedule. In addition to the work described there were numerous other jobs which had to be taken care of before the track was ready. Two miles of guard rail were put up and a wire fence was constructed all along the front of the grand stand and at other points. The concrete piers for the grand stand, 250 in number, also had to be poured. A tunnel had to be dug under the track at one end of the grandstand so that automobiles could get into the infield where parking space was provided. The grandstand itself, which was a steel structure, was not put up by the Juniata Company. One of the last minute jobs was the painting of the guard rails and fences. This was done on the Saturday before the races began. The men on the job all entered into the spirit of the occasion and did everything possible to help along with the work. On this night work the wisdom of using so many machines was demonstrated, for the machines did this work without any additional charge for overtime. They didn't even notice whether the whistle blew.

The superintendent in charge of the construction of the track was W. W. McCray. He is a Penn State graduate who went to war, worked for the State Highway Commission for a short time, and who has been with the Juniata Company for the last 7 or 8 years. He was on the job morning, noon and night and kept things moving along without any serious delays.

The list of equipment given above makes no mention of the trucks and teams that were used. About a dozen

The gasoline crane which did a big part of the heavy work

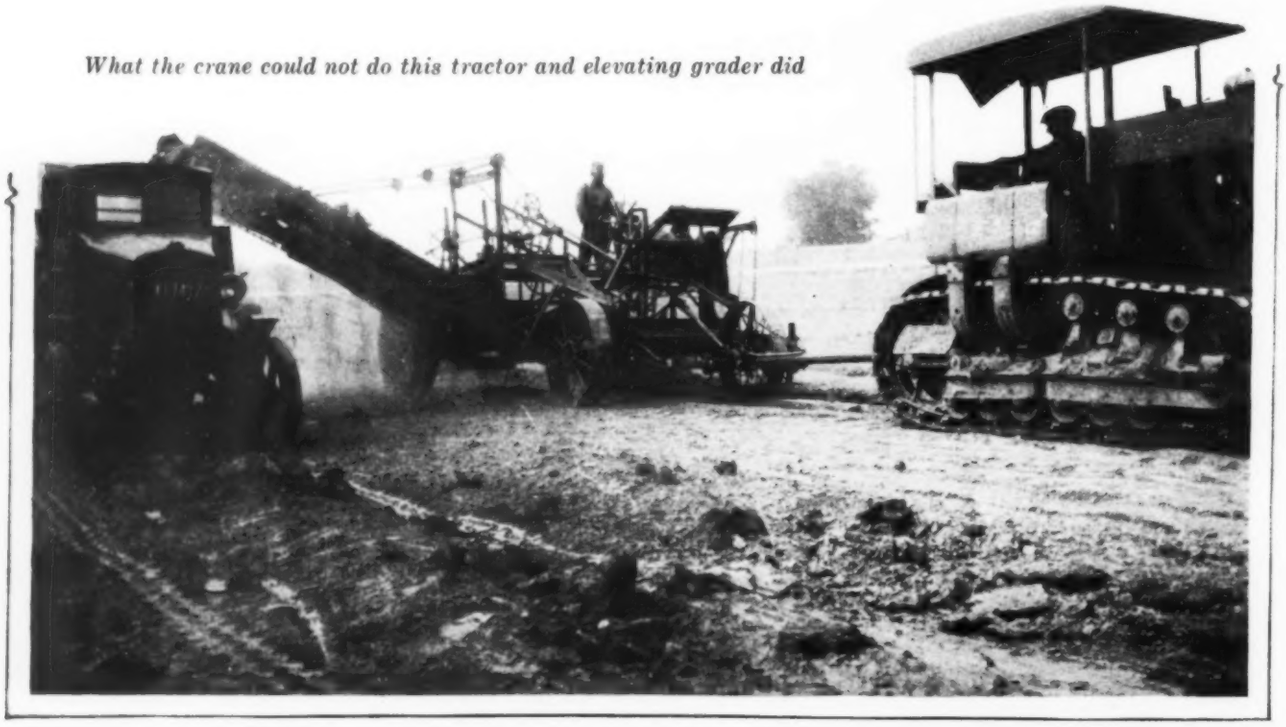
of each were on the job most of the time. Mr. McCray was quite proud of his big road drag which is shown in the right-hand picture on page 7. This contraption was made to order for the racetrack job. As can be seen from the photograph it was a huge affair about 20 ft. square. The 10-ton rollers and the caterpillar tractor took turns at pulling it around the track again and again and it played a big part in getting the surface in shape in time for the races.

It is a rare thing to hear a contractor express a wish that it would rain, but that it just what the Juniata people wished for during the last few days. A week or so of clear weather dried out the track so that it was hard to work it into shape. Several tons of calcium chloride were spread on the track the last minute and helped greatly to put it into usable condition in time for the trial heats on Sunday, May 30th.

The accomplishment of so big a job in so short a time, equivalent to the building of about four miles or ordinary earth road, shows what can be done with modern construction machinery. About 35,000 yd. of earth was moved, in addition to all the other work which was necessary. Speed was the watchword from start to finish and it was the use of machinery that made this speed possible.

Although the Juniata company relied to such a large extent on the use of labor-saving machinery in the construction of the speedway, all the machinery in the world would not have finished the job on time had it not been for the enthusiastic co-operation of the men who

What the crane could not do this tractor and elevating grader did



were employed. As said before practically all of them were drawn from the Juniata Company's regular organization, and from the very beginning they entered into the spirit of the job and did everything in their power

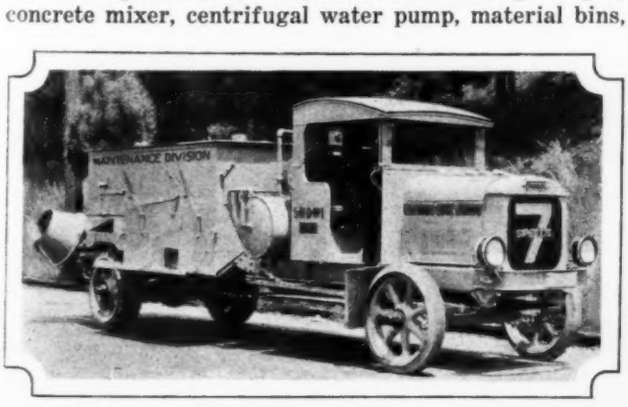
A one-man grader working in the infield

to keep things moving. For example, on several evenings they insisted on working right through until half past nine or ten o'clock without taking time off for dinner in order that they might get the benefit of every minute of daylight. They carried the daylight-saving idea to extremes. The work of the Juniata organization is based on a twelve-month year and the end of the construction season does not mean a cut down to a skeleton organization during the winter months. Every year at the time when work is slack Mr. Jacob gets together his entire gang for a big party of some sort. The results of this policy were never better illustrated than on the speedway job. Every man regarded the time limit as a sort of personal challenge and the entire outfit backed Mr. McCray from the minute the first bucketful of earth was excavated until the finished track was turned over to the Speedway corporation. The Juniata Company puts its faith in machines, but has equal faith in the men who run them.

The big road drag on its way around the track

This Truck Can't Climb a Tree

THE Colorado State Highway Commission is now using the road maintenance truck shown in the accompanying photograph. This type of truck was first tried out in Kern County, California, and, as may be seen in the photograph, is so equipped that it can handle almost any sort of highway maintenance work. The equipment of the Colorado unit includes an air compressor, air tank, water tank holding 150 gal., concrete mixer, centrifugal water pump, material bins,



Ready for the road

paint spraying outfit, pneumatic tools and a grading plow. The truck has power enough to pull the grading plow either by attaching it to the rear draw-bar or the side arm which can be swung out.

The men who travel on the truck have to be jacks of all trades so far as maintenance is concerned. They must know how to use pneumatic tools for breaking up damaged pavement; they must know how to mix cement in the small concrete mixer; they must be experts in putting up fences and traffic signs, and must be able to paint with a spray outfit.

If they are to work on bridges, they can use the sand blast outfit to remove the old paint or rust from the steel work, and they can cut or weld the steel work with the oxy-acetylene outfit.

The machine built for Kern County has been in use about 3 years and has done excellent work. The Colorado Highway Commission expects to keep its truck busy continuously on the state highways.

Breaking Up Old Concrete

ON a road job near Barton, New York, C. E. Smith had to remove about a mile of old concrete road that was to be replaced by a more modern one. It was found to be a mean job until the contractor hit on a novel plan. As part of his equipment he had a Bay City skimmer scoop excavator that he intended to use for grading. The pavement was split up into slabs, approximately 9 ft. by 12 ft., each slab weighing several tons. The excavator then was called upon and

The slab is shattered by fall

picked up one end of the slab, lifted it to a vertical position, and then tipped it over. The shock split the concrete into pieces small enough to be picked up by the machine and loaded into trucks to be hauled away.

Ditcher Turns Fire Fighter

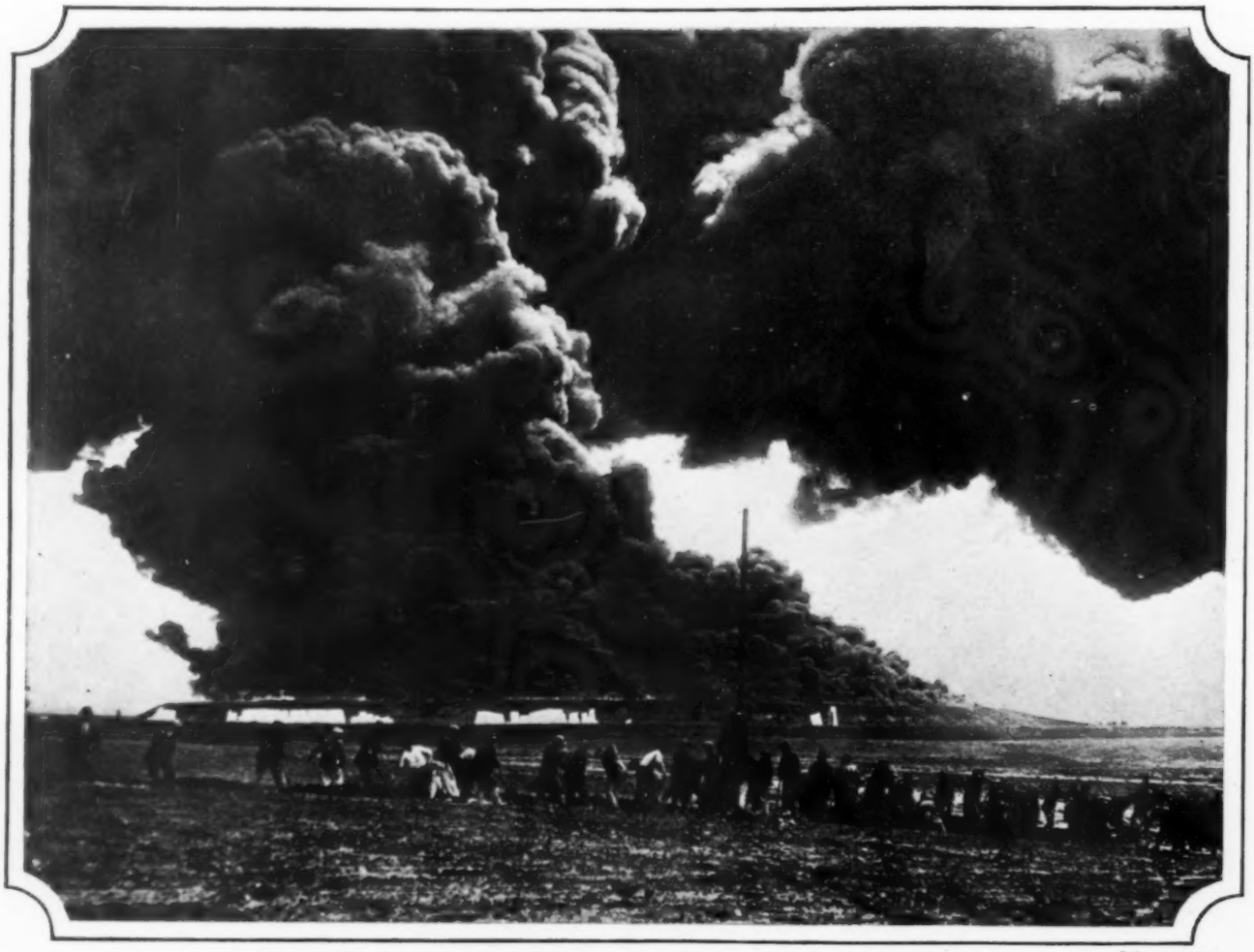
Digs Trench in Face of Approaching Flood of Flaming Oil

WHENEVER a cyclone or a flood makes an unwelcome visit to a community, a general mobilization of all of the construction equipment in the neighborhood, such as cranes, power shovels and tractors, takes place. Thus far, however, construction equipment has not done much to make itself famous in the fire fighting line. That work is generally left to the machines designed for that specific purpose.

At a big oil fire near Brea, California, recently, which began when lightning struck a tank farm, two Barber-Greene ditchers distinguished themselves as fire fighters. The only way to stop the fire was to build a barricade through which the oil could not penetrate, and this was accomplished by digging a trench 18 in. wide by 2½ ft. deep, constructing a galvanized iron wall of corrugated sheets set on end and lapped over each other and then throwing back the dirt to hold the sheets in place.

The photograph at the bottom of this page shows a gang of men digging away in frenzied fashion before the ditcher arrived. The first ditcher, owned by N. E. Carter, had been working about two miles away, but was idle at the time because of the rainy season. The regular operator was not on hand, so Mr. Carter sent his 21-year-old son to take charge of the machine. The young man had never run it before, but he manipulated the levers for a while to find out what they were for, and then ran the machine across the field toward the fire. When the ditcher began to dig, it maintained a rate of 300 ft. per hour. Several times the flames came so close that young Carter had to abandon the machine. When he did this he left it in gear and it kept right on digging until a shift in the wind enabled him to get back. The full crawler treads held to an approximately straight line without guidance, and on each occasion the wind shifted in time to save the machine.

Another Barber-Greene ditcher owned by Robert Howard was brought on a trailer from Los Angeles 25 miles away. This machine was used in the same sort of work, and both ditchers remained on the job until the fire had been checked and emergency was over. The photograph on the cover of this issue shows Mr. Carter's ditcher taking a well-earned rest after a strenuous session of digging in the face of the flames.



When the ditcher arrived it did this work at the rate of 300 ft. per hour

Streams failed to halt the flames

The great oil fire at Brea, Cal., sweeping across the fields.
Before it was checked, this fire caused a loss of about $6,000,000.

This airplane view shows the immensity of the conflagration.

Sticking to the Schedule

Major Construction Operations Are Progressing in Proper Sequence on Boston Hotel Job

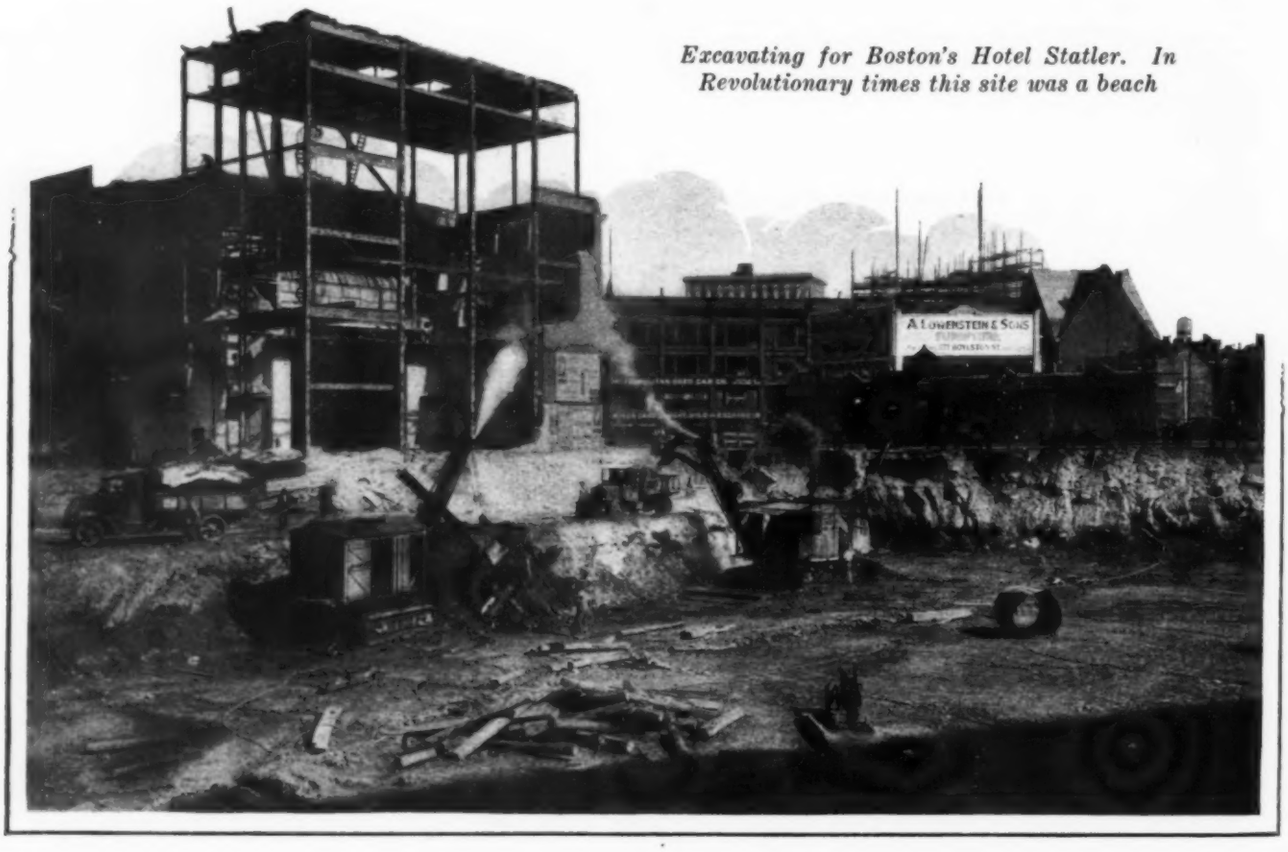
IN CONSTRUCTION WORK of any kind, keeping the various operations running along from start to finish in the proper sequence is always the pious hope of the contractor when he begins the job. Too often, it becomes a forlorn hope before the work has progressed far. Some steel that he has counted on is delayed in transit, rain interrupts one part of the work, while the rest goes on, and other circumstances tend to disrupt the most carefully thought out schedule. Often when the job is practically completed, some item which the contractor expected to have out of the way in the earliest stages is still unfinished and proves the last thing to be done.

The large photograph on the opposite page shows a big construction job on which the work is progressing according to schedule and all the major building operations have been carried on in the proper sequence to give maximum speed and economy. This photograph shows the Hotel Statler and office building now under construction by the Dwight P. Robinson & Co. in the Park Square section of Boston. This building covers the entire block bounded by Arlington Street, Columbus Avenue, Providence Street and St. James Place. It is built on historic ground as the British troops started for Lexington by embarking from a beach on the Hotel Statler site. At one time while the excavation was in progress the boats in which the British embarked would have proved very useful as a sudden rain storm aided by some old and disused sewers which had been broken through by the steam shovels, flooded the entire site.

A close inspection of the large picture will show the final steel in process of erection on top of the building, riveting in progress two floors below, floors being poured lower down, bricklaying going on at a still lower level, and the windows already glazed on the first and second floors, all according to schedule and in the proper sequence.

Work was begun on the Hotel Statler on August 21, 1925, and was carried on throughout the winter. The building will be open to the public in the fall of this year. The excavation subcontract was awarded to the J. F. White Contracting Company and the George F. Watts Corporation has erected the steel. The architects are George B. Post & Sons of New York.

The photograph at the bottom of this page shows the work of excavation in progress with two steam shovels on the job. The photograph which bears the initial letter of this article shows the structure as it is at present. The schedule is still going strong.



Excavating for Boston's Hotel Statler. In Revolutionary times this site was a beach

The Hotel Statler as it looked after eight months of work

Indian School Builds Stadium

Haskell Students Help Kansas Contractors Construct Modern Arena for Football Team

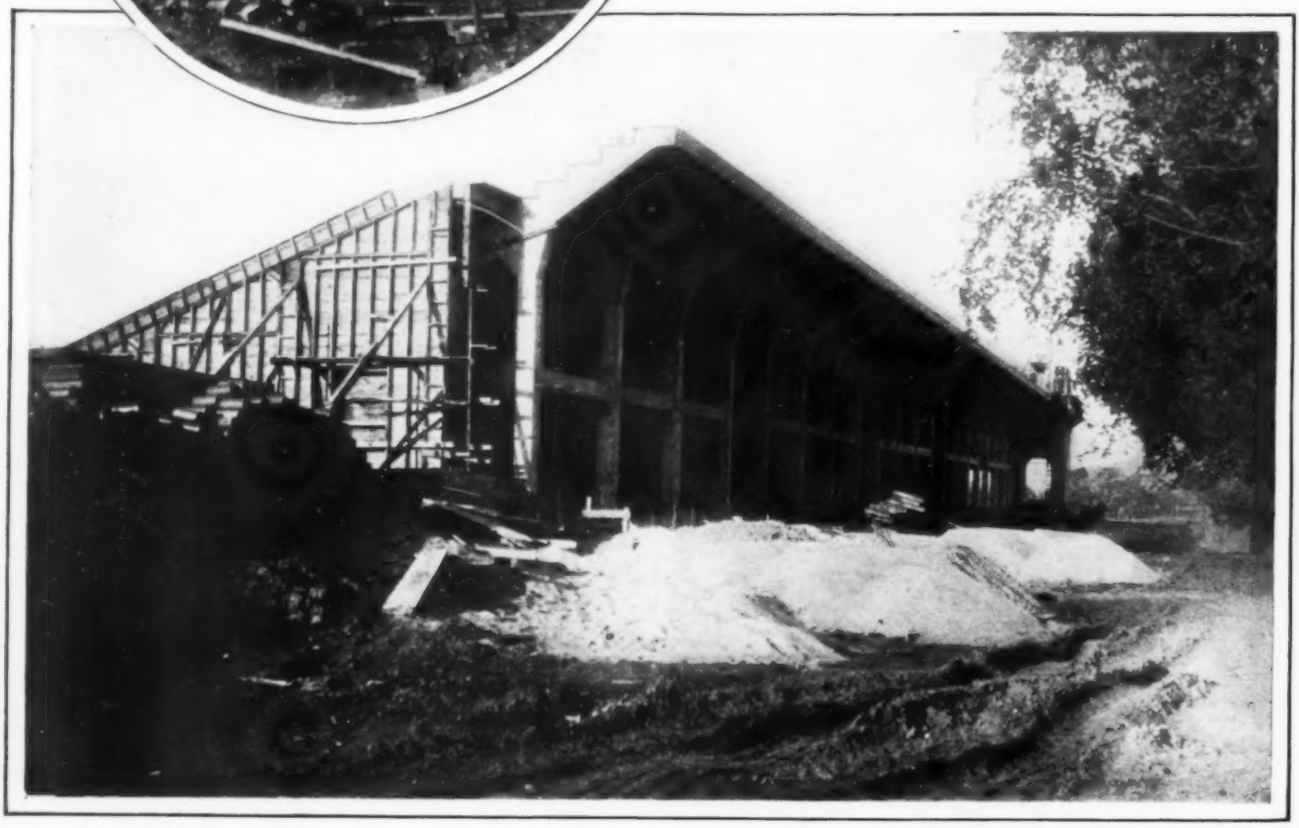
A FOOTBALL team without a modern stadium to play its home games in is hardly worth while in this day and generation. The Haskell Indians have done so much traveling in recent years playing games in the palatial stadiums of their opponents that they felt the urge to build one of their own. The Haskell Indian School is at Lawrence, Kansas, and a new concrete stadium is now being built which will be ready in time for next fall's games. It will seat about 10,000 persons and will cost about $200,000, this sum being raised by the Indians themselves, who organized the Haskell Stadium Corporation to handle the job. In addition, a considerable part of the labor is being done by the Indian men and boys connected with the Haskell School. The contractor for the work is the Eberhardt Construction Company of Salina, Kan., and R. O. Shriver, another contractor of Salina, is the superintendent and engineer in active charge of the work. The stadium was designed by Prof. L. C. Conrad, of the Kansas State Agricultural College, who also is acting as consulting engineer for the work.

The photographs which accompany this article show various phases of the construction work. Careful planning before work began has considerably reduced the cost of the job. For example, all of the forms were designed before any construction was started. They are made in sections, and most of them are being used four or five times. As fast as they are taken down on one part of the stadium they are put up further along the line.

The method of operating the mixer and chuting

At left—Rig used for bending wire mesh used for reinforcing

Below—Tower, mixer and hoists were moved along behind structure



tower are shown in the photograph at the bottom of this page. As may be seen in that photograph, the tower mixer and hoist are all mounted on a platform which is moved along behind the stadium on rollers as the work progresses. This photograph also shows the system of shoring which consists of trestle bents made of 4 by 6 in. posts varying in height from 4 to 28 ft.

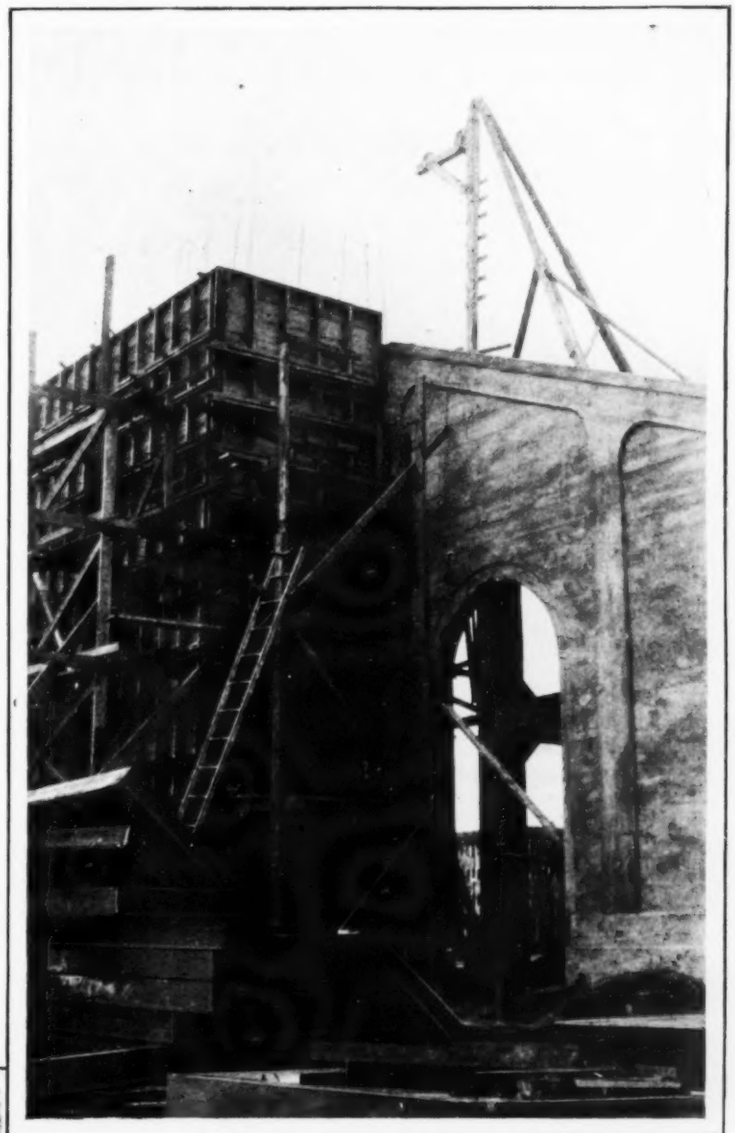
The photograph at the bottom of page 12 shows the rear half of the stadium after the trestle bents had been removed and gives a good idea of the type of construction. A back wall is to be added later. The forms for the end wall are still in place in this photograph.

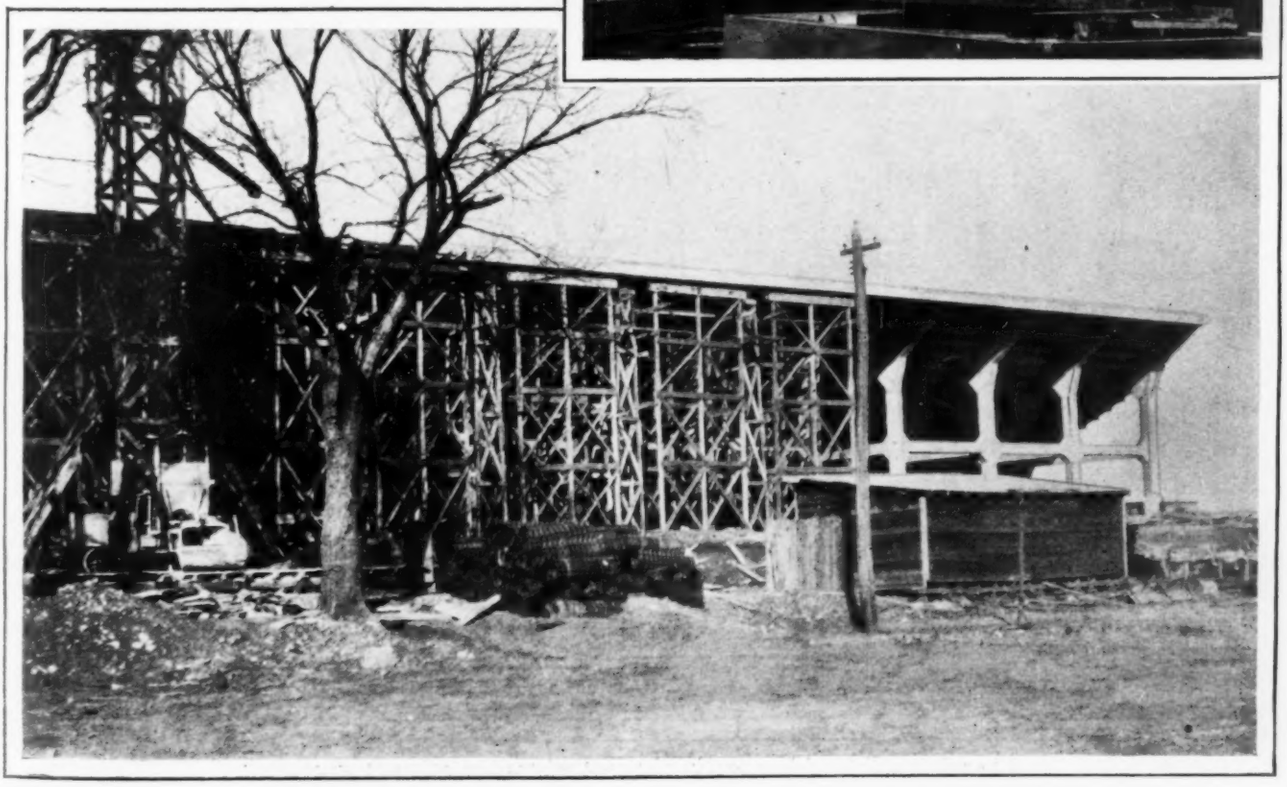
An ingenious rig is being used on this job for the purpose of bending the wire mesh reinforcing to fit the shape of the concrete seats. This machine is shown in the circular photograph on page 12. Mr. Shriver states that this rig "puts a permanent wave in the mesh" and he adds that it accomplishes this effect at a cost of about 1 cent per square yard which is considerably below the price charged for permanent waves in the average beauty parlor. The way in which the machine is operated can be easily seen from the photograph. It is adjustable so that it will fit the varying heights of the risers.

The photographs of this work were sent to *Successful Methods* by Mr. Shriver, who has been a reader of the magazine for several years. Such contributions always are welcome.

At right—Building tower at end of the stadium

Below—A section of the stadium after the forms had been removed





Stave Caissons Solve Foundation Problem

Construction of Expensive Cofferdam Avoided in Building Concrete Piers in Swiftly Flowing Stream

By A. B. MacMillan,
Chief Engineer, Aberthaw Company

IN CONNECTION with a building designed by the writer and now under construction at Woonsocket, Rhode Island, an interesting foundation problem presented itself.

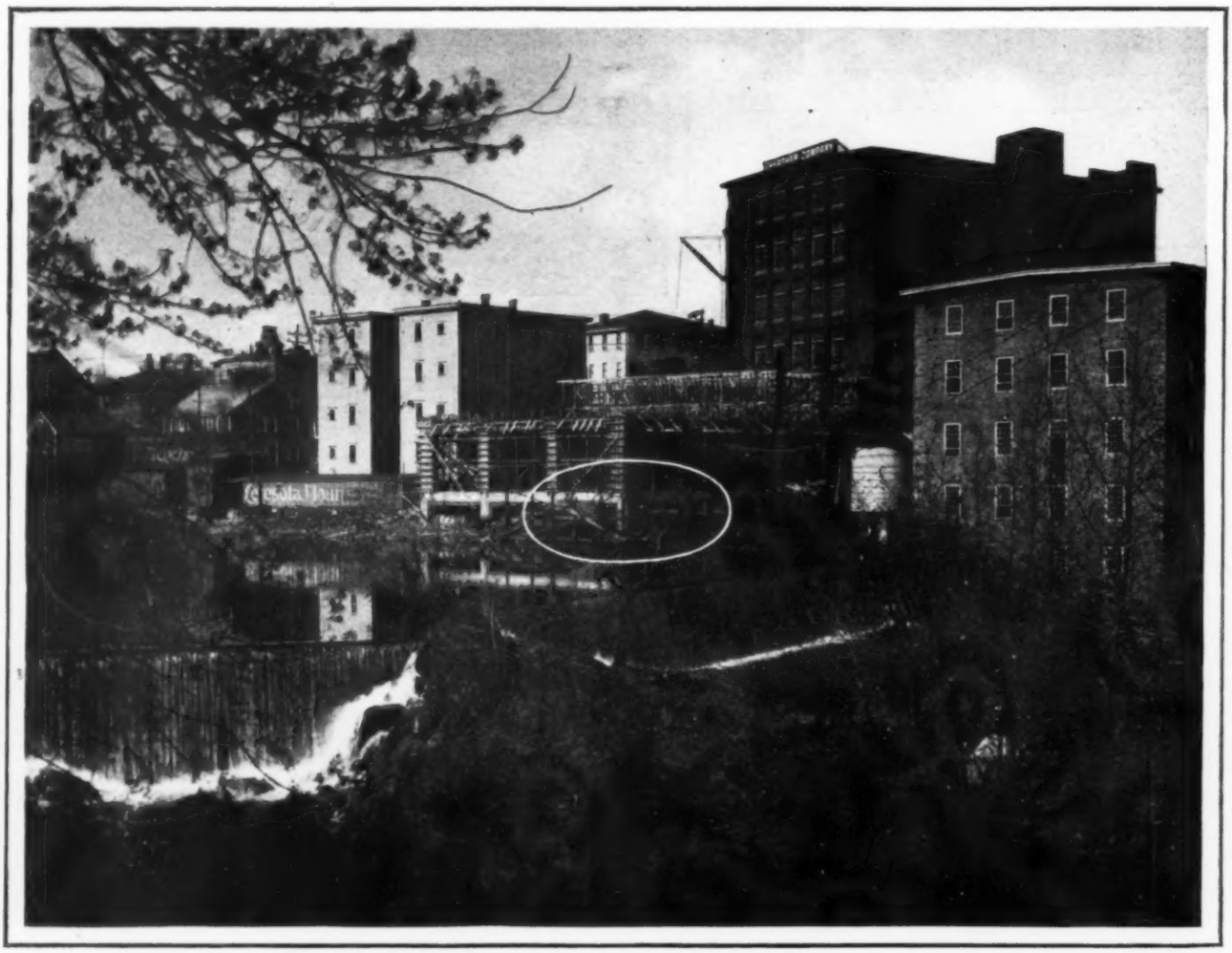
One corner of the six-story building projected out into a canal, where the current was very rapid. The specifications called for carrying concrete piers—three of which were located in the canal—to ledge, which at the outer corner of the building sloped to about 9 ft. below the surface of the water and was very irregular.

To cofferdam this section would have meant an amount of work all out of proportion to the small area involved and it was accordingly decided to use a separate wooden caisson for each of the three piers. These were constructed of 10-ft. staves, beveled and splined. A sufficient number of these staves was purchased to make three complete circles. These were held together by circular rings sawed out of plank and placed both inside and outside the staves.

The first operation was the building of a wooden staging. This was of sufficient width to get the caissons inside and was somewhat heavier than the ordinary staging construction.

The stave caissons were then built up, suspended over the exact location, and each stave lightly nailed to the wooden rings. Each caisson was then lowered into position and each stave driven to rock by means of heavy wooden mauls. The points of the staves had previously been chiseled.

It was necessary to drive these through approximately 18 in. of mud and cinders which covered the canal bottom. In the case of one caisson, a stone was encountered lying on the ledge and an attempt was made to leave this in place. However, before excavation



The white elliptical line marks the spot where the caissons were sunk

within the caisson was completed a blow-out occurred. This difficulty was overcome by driving a square form inside the caisson and filling the space between the caisson and form with the excavated material. This made a practically water-tight job.

The wooden caissons cost $90 each, and the cost of driving made the total cost for the work complete approximately $500, which is believed to be much less than if a cofferdam had been built, and the necessary pumping and excavation equipment used.

Incidentally, the staging from which the work was done was so constructed as to provide a support for the concrete forms at this corner of the building, and would have been necessary regardless of the method of constructing foundations. This, of course, reduced the amount which was charged directly against the foundation work.

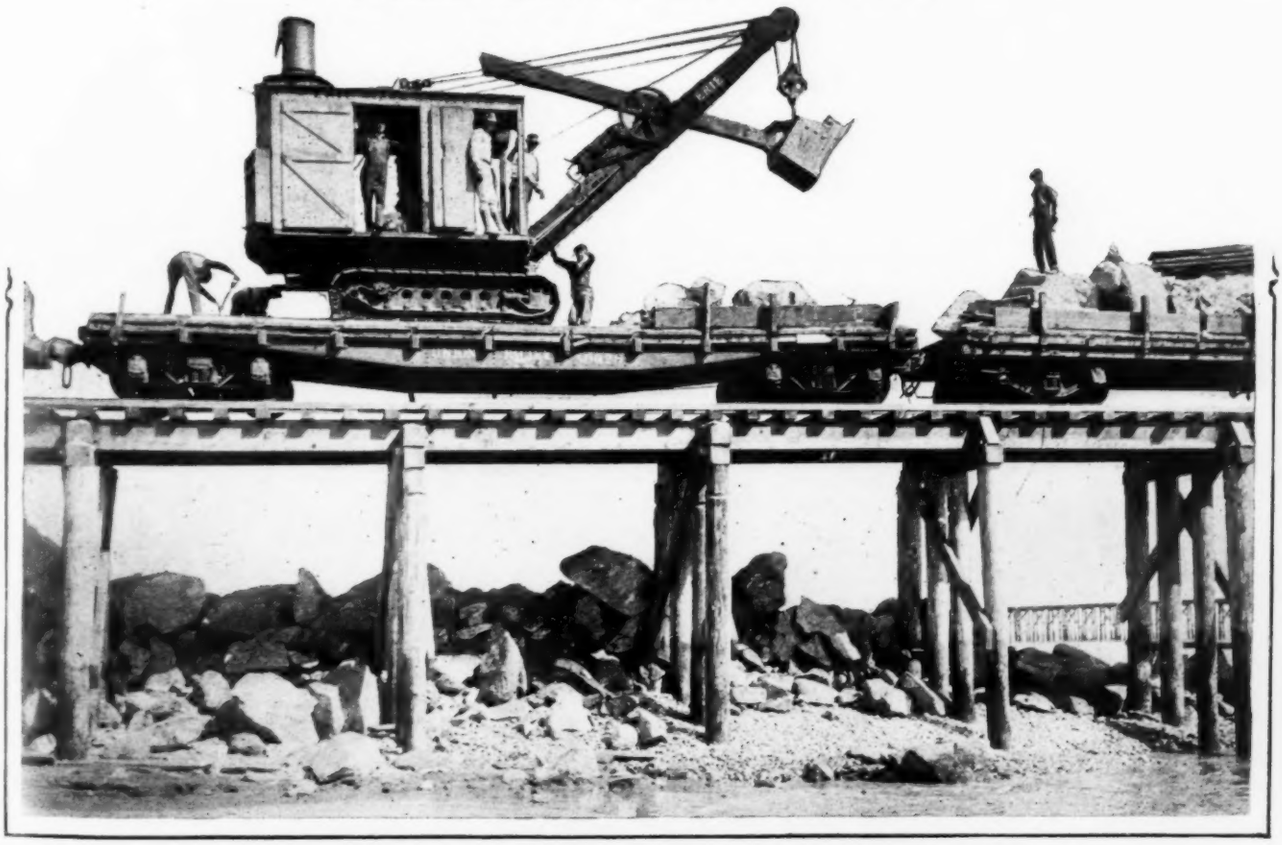
The large photograph at the bottom of page 14 shows the job under way and the elliptical white line in the center of the picture shows the corner of the building where the caissons were sunk in the canal. At the time this photograph was taken, the first two stories of the building were up and concrete was being poured for the third story. The staging which later was used for supporting the concrete forms may be seen within the white line.

The staves were driven down with a wooden maul

Unfortunately no one was present with a camera at the time the caissons were being driven down through the mud and cinders covering the bottom of the canal, so the drawing on this page was made to illustrate the construction of the caisson and the method of driving down the staves. The design of the wooden rings is clearly shown in this sketch.

The Aberthaw Company has been engaged in construction work in New England for more than a quarter of a century and was one of the pioneers in the use of concrete in that section of the United States. The building described in this article is one of a number of contracts that the Aberthaw Company has undertaken at the present time.

Steam Shovel Rides to Work

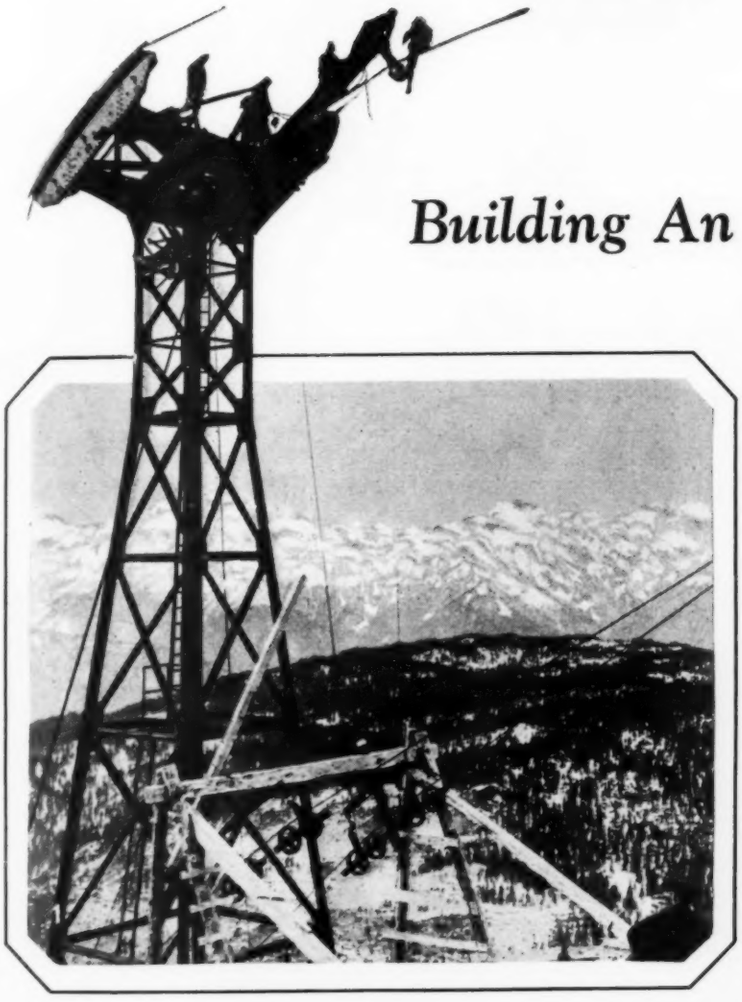


This outfit is used in building a breakwater at Long Beach, Cal.

© International.

A Florida highway in the making.

Building An Alpine Railway



1. Working on one of the Towers
2. High Up On the Side of Zugspitzi
3. Where the Snow Never Melts

Have You a Little

IF YOU have, here's a chance to pick up a little extra change and at the same time let the rest of the construction world see what you are doing.

Successful Methods will pay $25.00 each month until further notice for the photograph most suitable to its needs taken by a man actually employed on the job shown in the photograph. Photographs should be accompanied by a brief description of the job, giving location, name of contractor, name of owner, size of job, when begun, when finished, etc. And don't forget your own name, your address and the nature of your work.

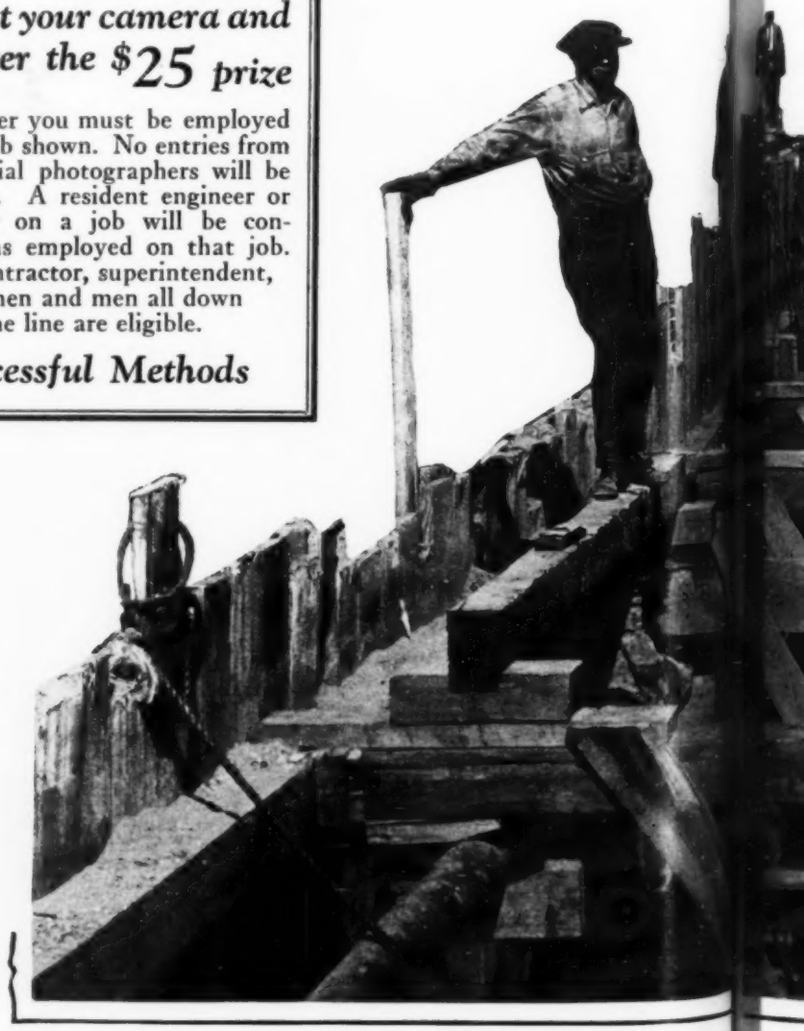
The Editor of *Successful Methods* will act as judge and will determine which photograph is best suited to the needs of this magazine.

All photographs should be sent to *Successful Methods*, McGraw-Hill Publishing Company, Tenth Avenue at 36th Street, New York City,

Get out your camera and go after the $25 prize

Remember you must be employed on the job shown. No entries from commercial photographers will be accepted. A resident engineer or inspector on a job will be considered as employed on that job. The contractor, superintendent, foremen and men all down the line are eligible.

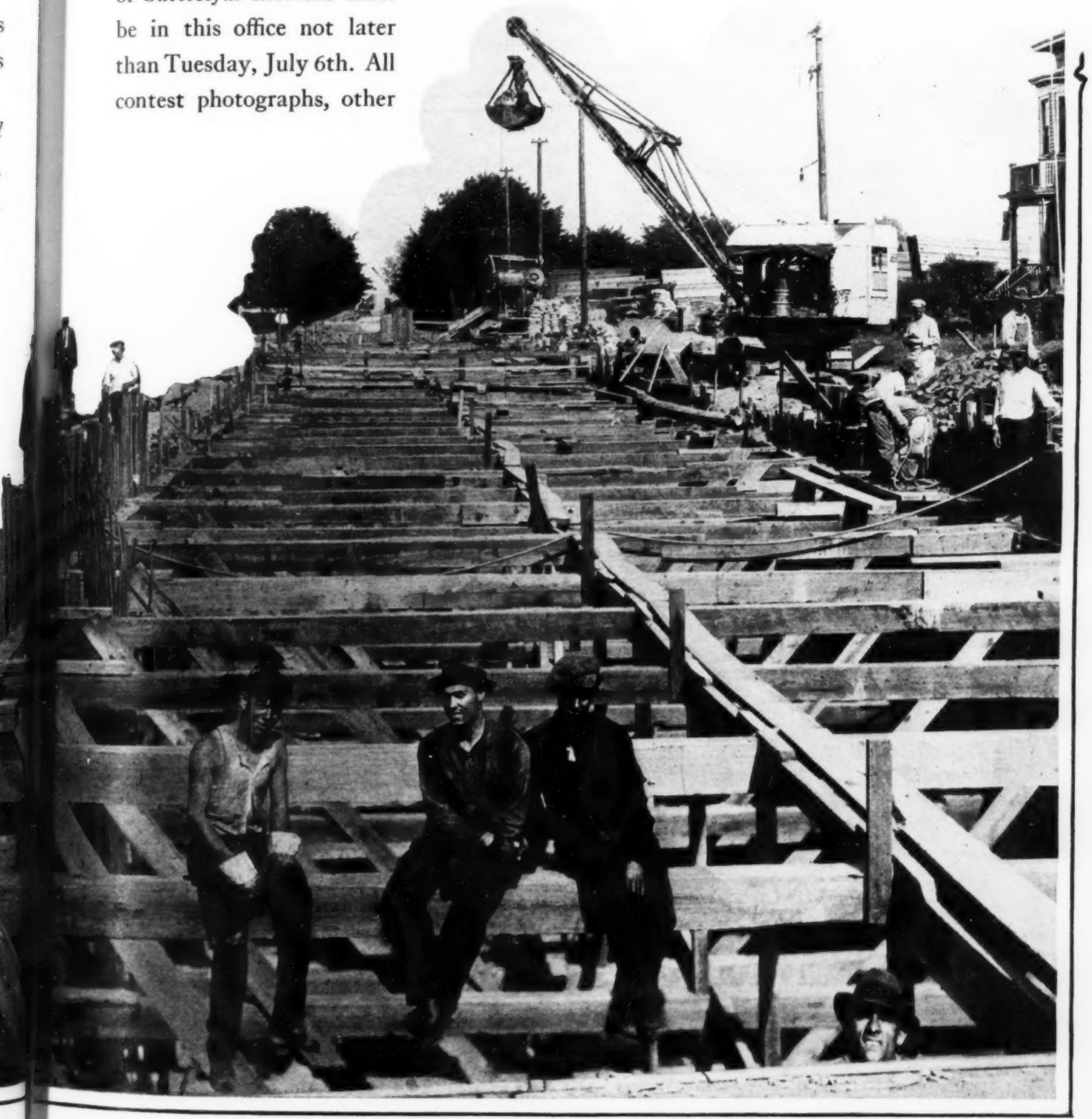
Successful Methods



Camera on Your Job?

and plainly marked "Photographic Contest."

Any picture that is to be considered in awarding the $25.00 prize for the August issue of *Successful Methods* must be in this office not later than Tuesday, July 6th. All contest photographs, other than the prize winning photograph, which are used in *Successful Methods*, will be paid for at the rate of $1.00 each.



Central Mixing Plant for Memphis

Concrete Will be Supplied for All Purposes Throughout City

ANNOUNCING a program of co-operation with material men and contractors, the V. E. Schevenell Construction Company of Memphis, Tennessee, has put into operation a central mixing plant for concrete. V. E. Schevenell, president of the company, believes that the establishment of such a mixing plant which can furnish concrete for all purposes for use throughout the city will be of genuine benefit to the construction industry as a whole.

The following paragraphs from the announcement issued when the plant was opened give a good idea of the purposes of the Schevenell organization:

"Ready Mixed Concrete means:

"To the Architect and Engineer, the assurance of a concrete exactly as specified and the use of absolutely clean materials.

"To the Contractor the saving of time, of equipment and of space for the storage of the materials and the wastage of sand and gravel on the job.

"Our policy will be to co-operate with our customers to the fullest extent. We will use whatever brand of cement desired. We are in no way in competition with the material dealers, but hope, through the increased use of concrete, to extend the sales of the component materials.

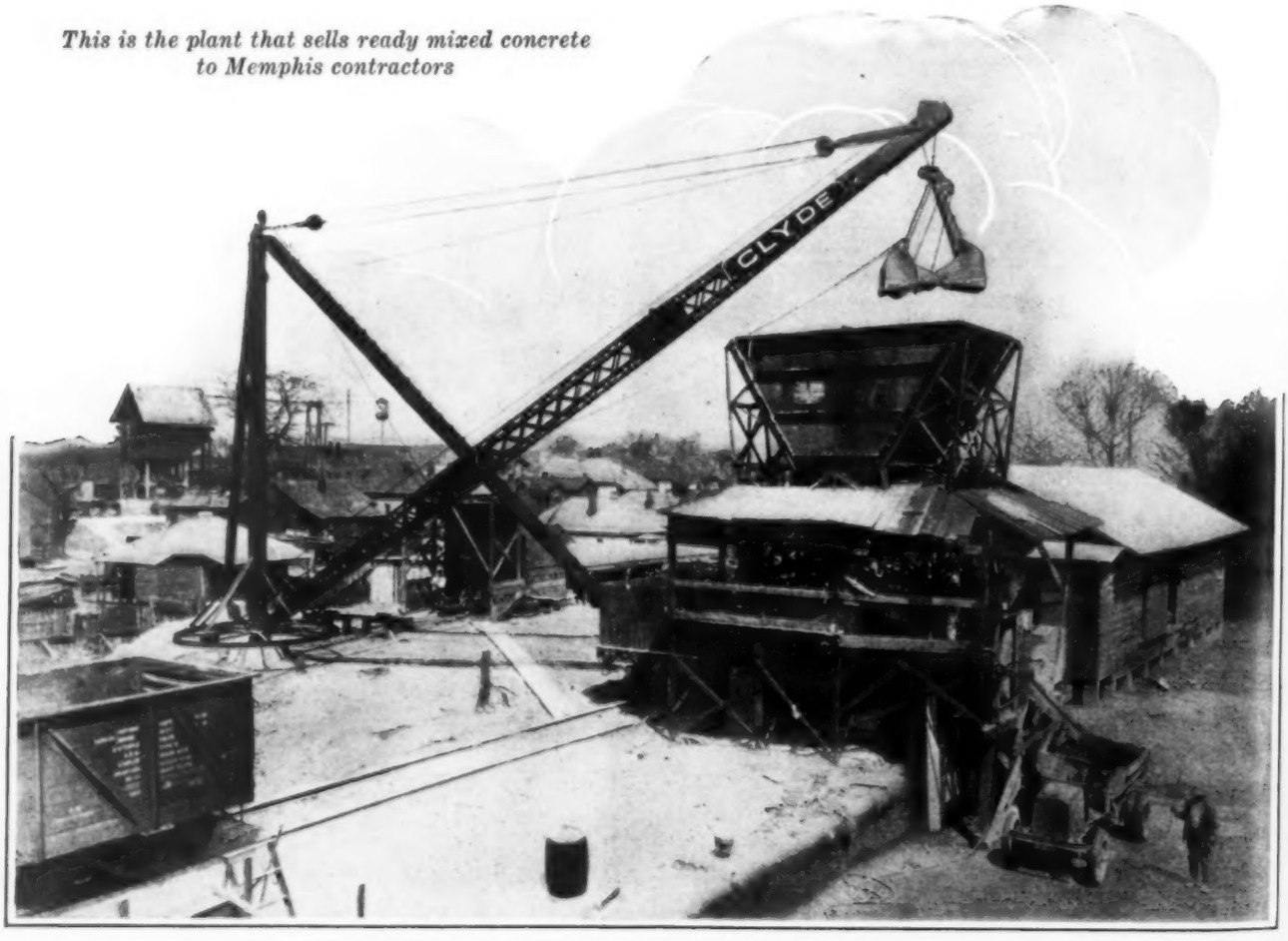
"Our intention is only to sell concrete, but in order to introduce the Ready Mixed Concrete, we will contract for driveways, walks, etc., or procure competent contractors to do the work."

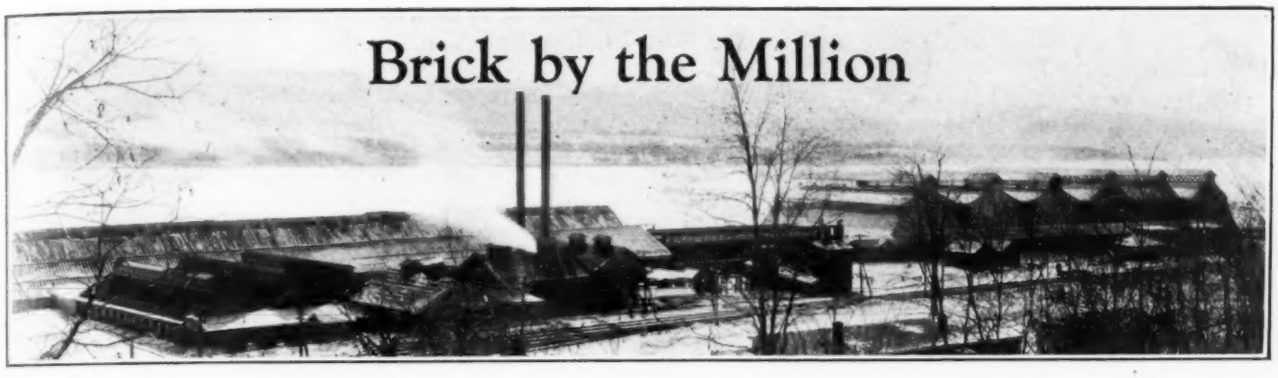
As the photograph at the bottom of this page shows, the plant, which is located on the tracks of the Southern Railway, is well equipped for its job. Aggregates are unloaded from the cars by a Clyde derrick equipped with a 1-yd. clamshell bucket and operated by a Clyde electric hoist. The material is dumped into steel measuring bins immediately above the mixer. The mixer discharges directly into the trucks which carry the concrete to the point at which it is used. The cement house, which has sufficient storage for a large quantity of various brands of cement, may be seen in the right background. The cement is carried from the house to the mixer by a belt conveyor. All materials are carefully weighed before they are allowed to go into the mixer.

The price schedule announced by the Schevenell company varies according to the mix. Hauling charges are stated for hauls of 1, 2 and 3 miles and for longer hauls special prices will be made.

At the present time the Schevenell organization is furnishing the concrete for an important city paving job.

This is the plant that sells ready mixed concrete to Memphis contractors





Brick by the Million

Modern Machinery Decreases Labor Costs and Increases Output of Long Established Plant on Hudson River

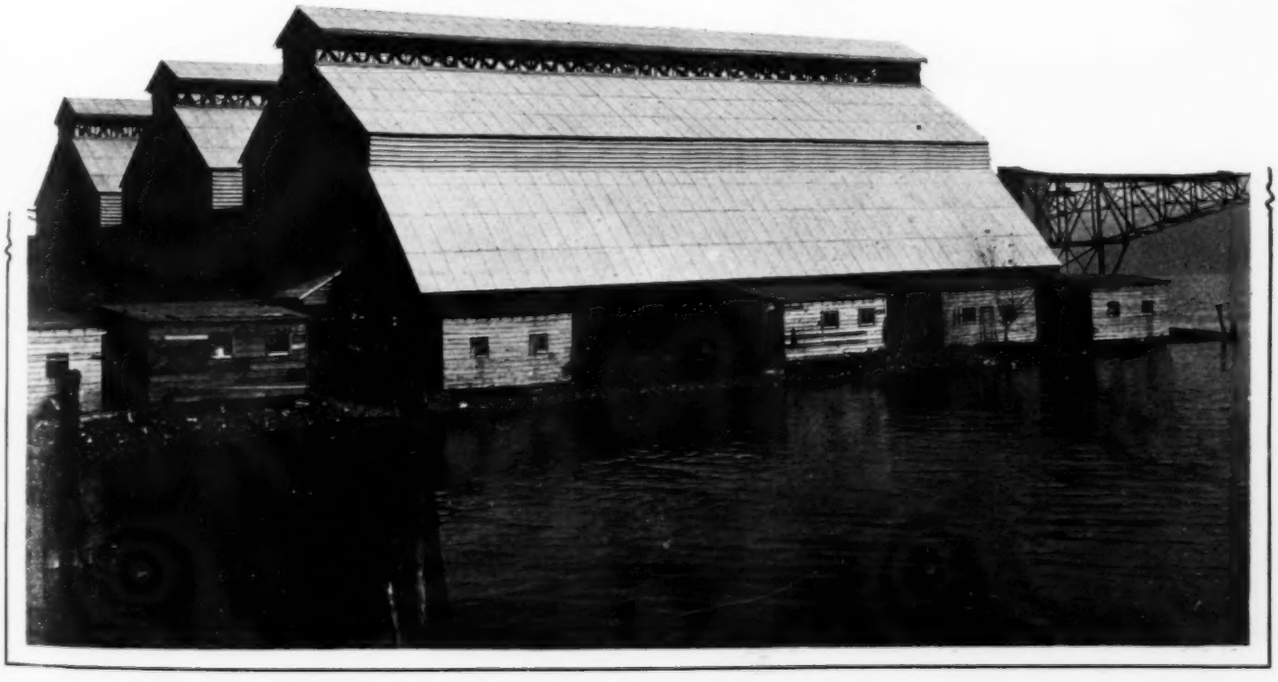
THE Hudson River has long been famous for its brickyards which for years have supplied most of the brick used in New York City. Some of these yards are operating in much the same way that they did when they were started many years ago, but others have kept pace with the times and have constantly improved their methods of producing and handling their products.

Probably the most modern and up-to-date plant anywhere along the Hudson is that of the Jova Brick Works at Roseton, New York, on the west bank of the river a few miles above Newburgh. This plant was started in 1885 by J. J. Jova and is now carried on by his sons. Each brick turned out still bears the J. J. J. impression that has come to be regarded as a mark of quality wherever brick is used.

The Jova Brick Works now produces 45,000,000 brick a year and the capacity of the plant is such that when running at its full capacity it can manufacture approximately 1,000,000 brick per week. The plant runs practically throughout the year, although sometimes in the winter a few weeks are taken off for necessary repairs. As the river is open only nine months, loading can be done only during that period and it is necessary to provide storage for the 8,000,000 or 10,000,000 brick which are made while the plant is icebound.

The clay pits of the Jova Brick Works are in a hillside about 500 yd. back from the River, and the clay is brought down to the Works by two trains of cars operated on narrow-gage track and hauled by gasoline locomotives. Two ¾-yd. power shovels, an Erie steam shovel and a Thew gasoline shovel, get out the clay. The transport equipment includes three locomotives, two of which are always in service, with one kept in reserve in case of accident. About 30 Easton 2-yd. cars are used, two trains handling the daily output. A number of cars always are kept ready for emergencies.

When the clay reaches the Works, it is handled by two automatic brick machines which were largely developed by the Jova brothers. These machines can turn out 85,000 brick per day, and the Jovas who started with a machine that molded only 6 brick at one time, rearranged and developed it so that it now stamps out 9 brick in each mold. The brick are then taken to



Steel kiln houses with gantry at left

the drying room by an ingenious arrangement of conveyors which are so arranged that they require very little attention.

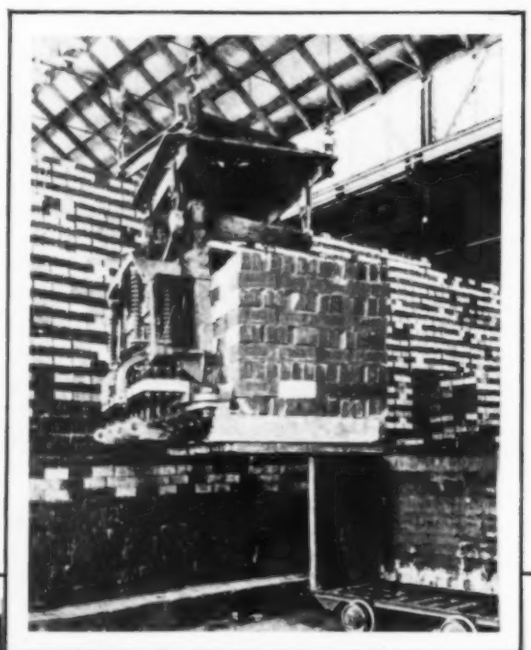
Six large steel sheds hold the kilns where the brick are burned. Each kiln burns about 2,000,000 brick, the process requiring approximately two weeks.

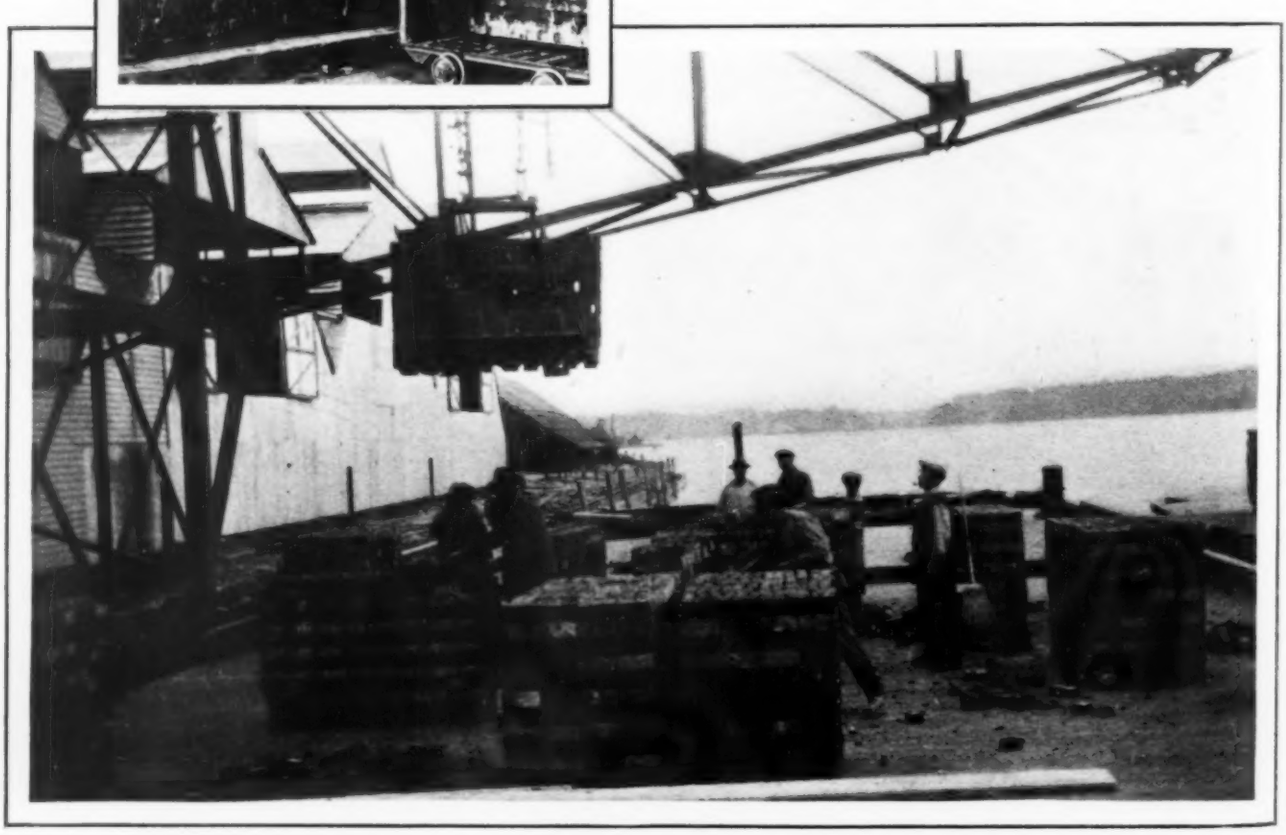
About two years ago, the Jova Brick Works adopted the Penfield system of loading brick, and a loading machine was installed. This machine handles the brick in large units, each holding exactly 1,216 brick. The kilns are so constructed before the burning begins, that these machines can pick up their 1,216-brick units, run them out and deposit them on the barge. The photographs on this page show the loading machine in operation. The small photograph shows the picking up unit inside the shed and the larger picture shows a unit ready to be lowered to the deck of a barge. The loading crane and the crane which takes the brick into the kilns move along one gantry in front of all six houses. This method of loading has made it possible for the Jova Brick Works to handle more brick in a shorter time than ever before, and also has greatly decreased the number of men necessary for this part of the operation.

An unloading machine has been installed at the company's new plant in Astoria, L. I., and its operation will be described in a later issue of *Successful Methods*. No other Hudson River brickyard is at present using this method of handling its product. The small photograph at the top of page 21 shows a general view of the Jova Brick Works. The six new steel kiln sheds are shown at the right and the old wooden sheds now abandoned may be seen at the left.

The savings effected by the introduction of all this modern machinery are reflected in the decrease in the amount of labor employed. A few years ago, 14 old type brick machines were in use and at that time the payroll averaged between 325 and 350 men. In addition two score horses were on the payroll. At the present time only about 140 men are needed and only a handful of horses are still working around the plant. Clark Tructractors and a Barber-Greene conveyor are used for such work as unloading coal and other similar tasks.

At the death of J. J. Jova, the eldest son, H. J. Jova, took charge of the yard, and later on the two younger



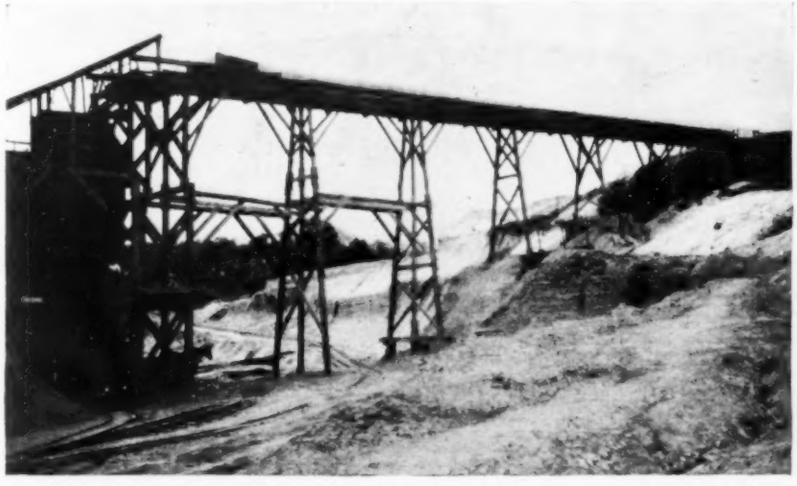


Two views of the unloading crane. At the left it is shown picking up a load of 1,216 brick in the kiln house

Below it is lowering a unit to the deck of a barge

brothers, J. L. Jova and Edward Jova, also entered the business. J. L. Jova is manager of production at Roseton and Edward is in charge of affairs for the Company in New York.

Machines are now used wherever possible at the Jova Brick Works and the Jovas always are on the lookout for new machinery to add to the efficiency of their plant. They have taken the lead among the brick producers of the Hudson River Valley and other plants are gradually introducing some of the machines which have been in use in the Jova Works for several years. The ancient proverb says that it is impossible to make bricks without straw. The Jovas are convinced that it is impossible to make good bricks without modern machinery. And there is no doubting the fact that they make good brick. Any plant that can dispose of an annual output of 45,000,000 brick, must turn out a product that can stand the gaff.



Clay pits at the Jova Brick Works. The clay is carried in small cars to the Works

The Jova Roundhouse. It isn't pretentious and it isn't round, but it does the work

Get Out Your Camera

Don't Forget that the

Photographic Contest

Begins with the August Issue

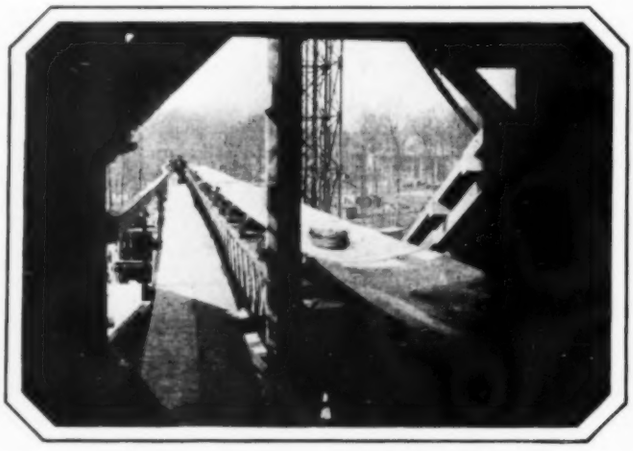
Turn back to pages 18 and 19
and read again
the conditions governing the contest

The Winner Will Receive $25.00

Well Fed Mixers Speed Big Job

Conveyors Keep Aggregates Hustling Between Storage Piles and Measuring Bins

PUTTING up an eight-story concrete building nearly 500 ft. long and almost as wide in 7 months means that things must be kept moving from start to finish. The B-W Construction Company of Chicago has undertaken such a job in Atlanta, Georgia, where a warehouse and sales building for the Sears Roebuck & Company is now going up. The new structure will be 480 ft. by 440 ft. Work began early in the year, the first concrete was poured on March 1, and the building is to be turned over to the owners on August 1.



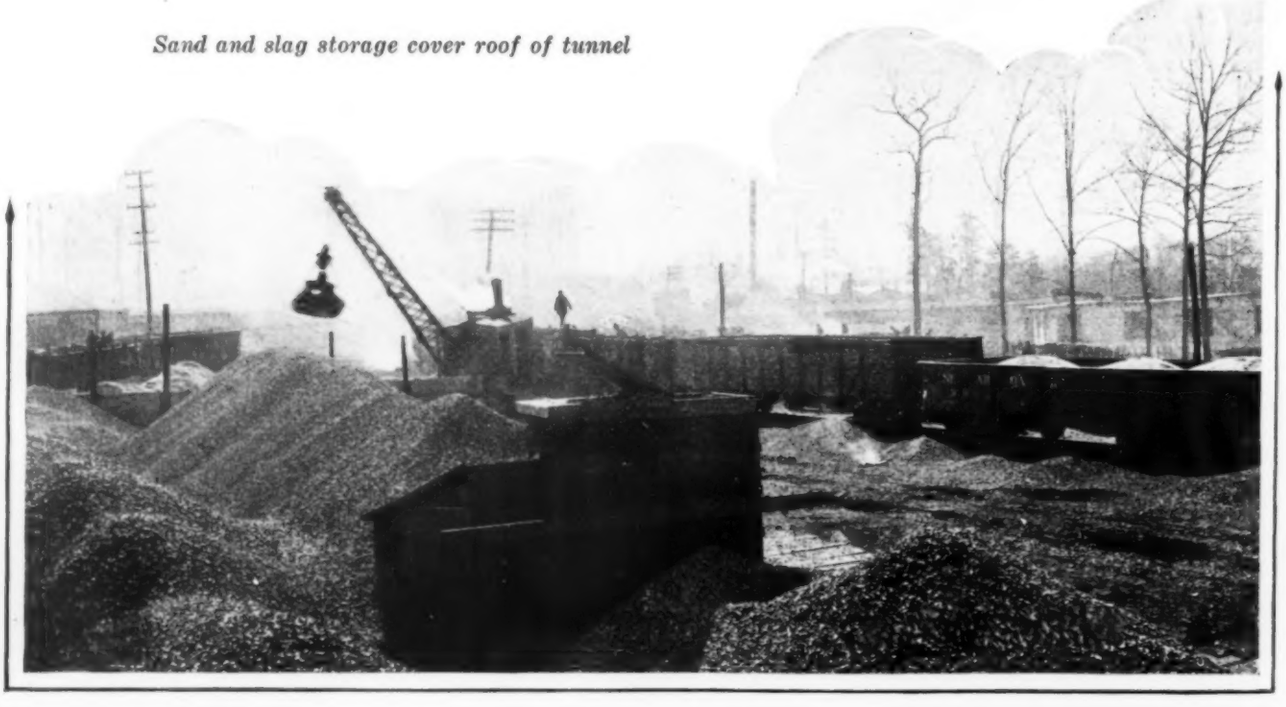
The conveyor comes out in the open

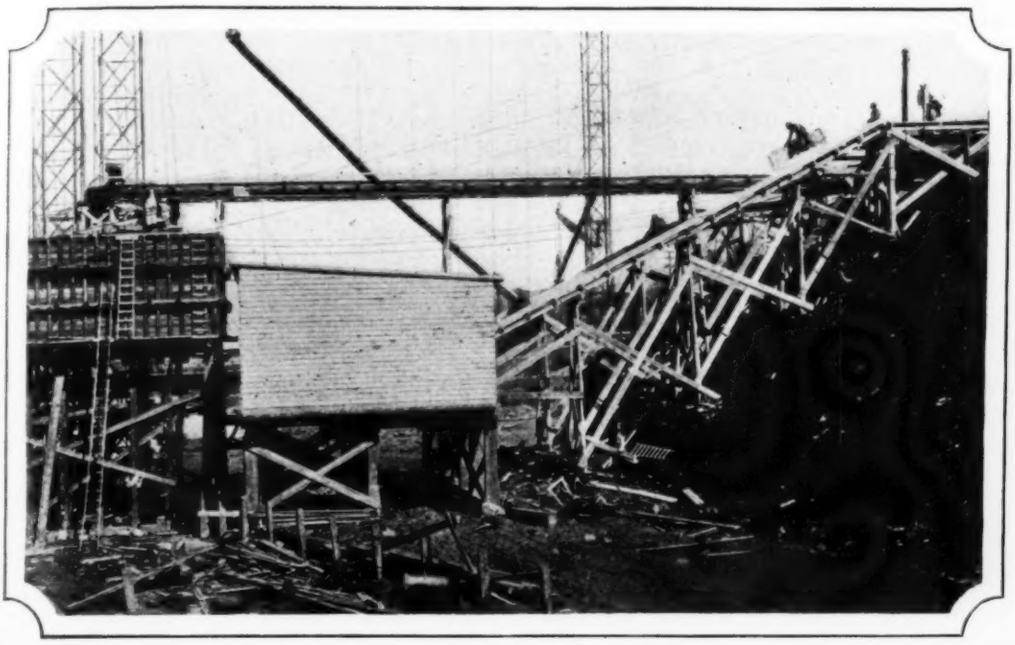
Although labor is not high as compared with some other sections of the country, the contractors realized at the outset that this was no job for hand labor. Charles A. Driver, the general superintendent, planned to operate two 21-E mixers and realized at once that it would be impracticable to feed these two big mixers by hand.

On a previous job in Kansas City, the B-W company had used conveyors to get the aggregates into the mixers and it was decided to adopt the same plan for the Atlanta building. An unusual situation made the planning of the conveyor system an interesting problem. All material is delivered by railroad and unloaded on a plateau about 50 ft. above the basement grade of the building. The edge of this plateau is 500 ft. away from the site of the building. A tunnel first was built in the top of the plateau and was planked over. Sand and slag were unloaded from the railroad cars by a crane and were deposited on the planking over the top of the tunnel, piled to a height which made it possible to store 5,000 cu.yd. The photograph at the bottom of this page shows the storage with the crane unloading cars in the background.

In the tunnel two Barber-Greene 24-in. belt conveyors were installed, one of them 200 ft. in length discharging materials on the second conveyor which is 248 ft. long. About 148 ft. of this conveyor is in the tunnel and the remaining 100 ft. outside. The photograph at the top of this page shows the conveyor issuing from the mouth of the tunnel and bridging the gap between the tunnel and the bins over the two mixers. Only light construction was needed to support the steel conveyor which also carried a guard rail and walkway. The

Sand and slag storage cover roof of tunnel





Putting up the conveyor system. The bins over the mixers are shown at the left and the mouth of the tunnel is at the extreme right

photograph shows the conveyor before the walkway was completed and also before the control house at the discharge end of the conveyor was built.

This control house is situated directly over the bins and the foreman who sits in it controls the material supply by pressing a button to indicate the material needed. He operates a push button system which signals the operators in the tunnel. A green light calls for sand and a red light for slag. The operators in the tunnel control 27 chutes under the storage piles and thus can furnish whichever material is needed without a moment's delay. The foreman and the two tunnel men constitute the entire material handling crew, and two shifts, each working 10 hours, furnish the aggregates for 1,000 cu.yd. of concrete, the daily output of the two mixers.

In addition to controlling the flow of material from the storage piles, the foreman is in charge of directing material as it goes into the bins. At the end of the conveyor is a chute which can be set to discharge into either the slag or the sand compartment. Sweeps also are arranged so that the material is deposited at the near end of the bins. At this point the belt runs on flat carriers and the sweeps are placed directly on the belt by the foreman who can see which part of the bin is short of material. The bin is a double affair because both mixers are running simultaneously. Batch boxes are hung just below the bin and above the mixers. The cement house is beside the bins and the cement, which, like the other aggregates, is delivered on the plateau, is sent down into the house by the steel-lined wood chute shown in the photograph at the top of this page.

The concrete from the mixers is handled by the tower and chute system. A double steel Insley tower is used which chutes the concrete to two secondary towers which elevate it a second time and chute it to the forms.

Looking over the job from the plateau where materials are delivered. The conveyor, bins and steel chuting tower may be seen at the left

Each secondary tower is located just outside the building line and its chute can take care of approximately half the building. The conveyor system has kept the two mixers supplied since pouring began without a single delay. Mr. Driver believes that if necessary they could easily furnish material enough for the third mixer as it proved necessary to reduce their speed after the work was well under way. He is, of course, enthusiastic over the fact that the layout which he designed cuts down the necessary labor on this part of the job to only three men.

The savings effected can be roughly determined by visualizing the cost of keeping two 21-E mixers supplied with slag and sand 20 hours a day by any other method. It would require some big additions to the payroll to hire enough negro laborers to handle this work. In addition to direct savings in labor, it is doubtful if any other method of handling the aggregates would keep the mixers running to full capacity. The conveyor system, as arranged by the B-W Construction Company, has enough reserve capacity, and the bins over the mixers are big enough, to take up any slack caused by an average mishap. Only a complete breakdown of the entire system would seriously affect the concrete schedule.

California Builds Memorial Bridge

THE California Highway Commission is just finishing a new bridge across the Klamath River about 45 miles south of the California-Oregon state line. This bridge is being built as a memorial to Doctor Douglas who for a number of years was prominent in Del Norte County and did much to advance the interests of that part of the state.

The Douglas Bridge spans the Klamath about 3 miles from its mouth, at a point where the river is nearly ¼ mile wide. Heretofore, the river has been crossed by a small ferry which could not be operated at times of extreme high or extreme low water.

Steel was the structural material first considered for construction of the bridge, but when the memorial features were introduced, it was decided the structure should be of concrete. The bridge, now approaching completion, consists of five main arch spans, each 210 ft. in length, with short approach spans at each end.

Much objection was presented to prove the impossibility of bridging the wild floods of the Klamath River with concrete arches; the current was too swift, the floods were too great, the drift too heavy (frequently full sized redwood trees, some as great as 15 ft. in diameter, float down the river with their roots dragging). The concrete arch spans, it was said, could not be built high enough or long enough to pass such drift; also, there was only an unstable sand and gravel bottom on which to build such large arches.

The Bridge Department of the California Highway Commission was not daunted by such objections. Comparative cost estimates of a steel structure and various combinations of concrete structures were made, the memorial features of the structure always being borne in mind. Final decision was made on a bold design of massive concrete arches founded on deep piles, surrounded and protected by cofferdams driven to refusal in the sand and gravel at the bottom of the river.

Carefully checked measurements were constantly under way during construction, and the centers were struck in the false work without apparent settlement of the arches.

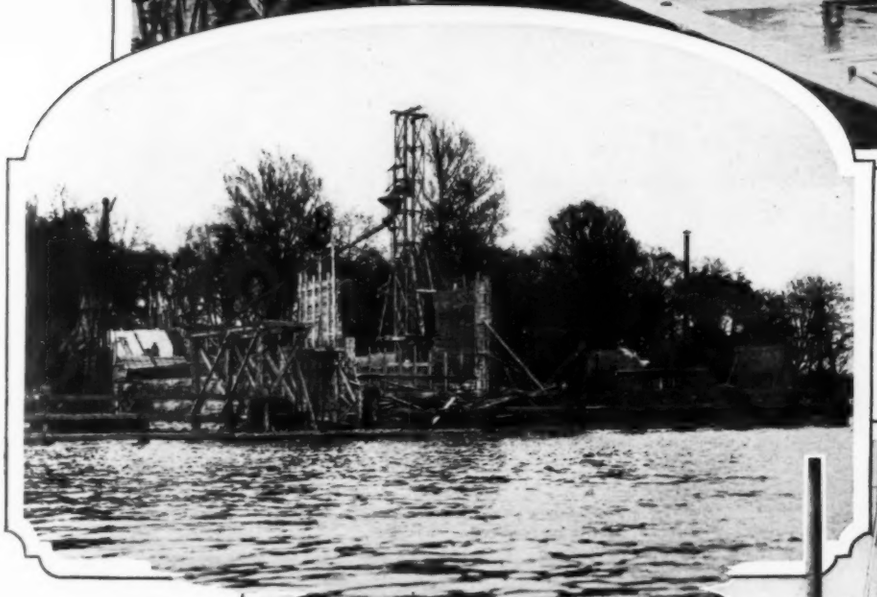
Throughout two winters, while under construction, this bridge has withstood floods, as great as ever have come upon the river, with absolutely no damage. The most delicate of engineering instruments have not detected any settlement, either of the arches or the foundation. Each pier of the bridge rests upon 150 piles, each pile hammered to refusal under repeated heavy blows. The piers are as firm as though built upon solid rock. This is an unusual record for foundation on bridges of this type. Even the designers expected some settlement when the heavy arches first carried the load for which they were designed.

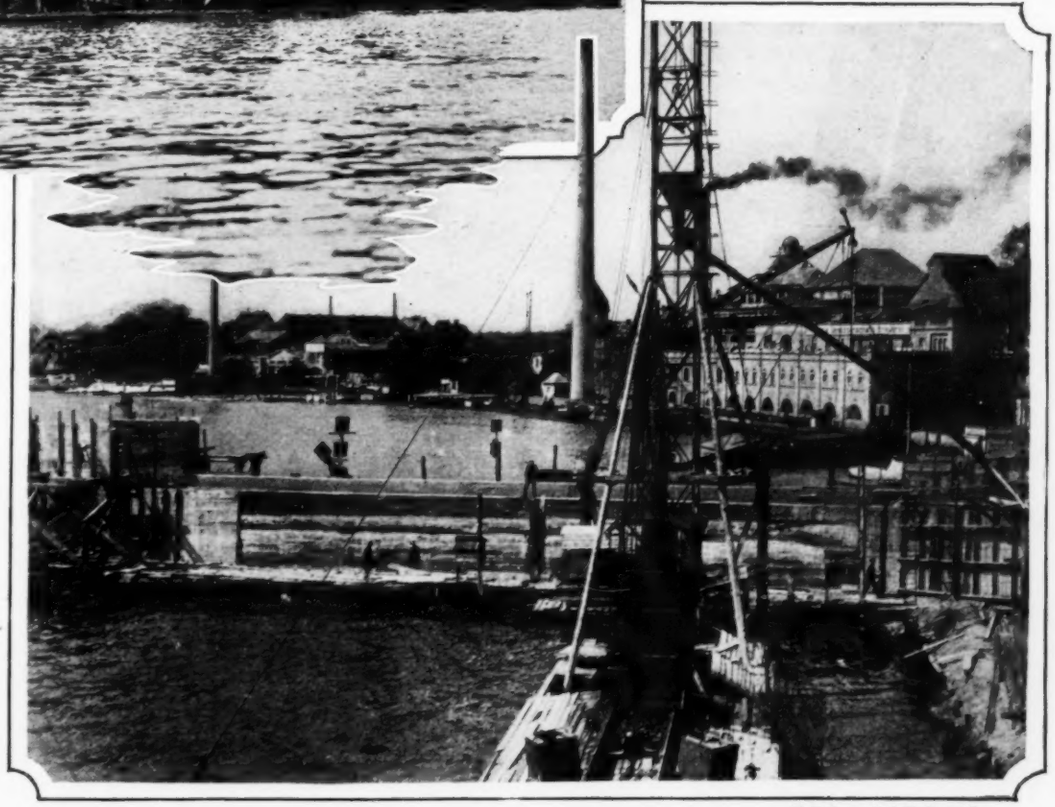
The completion of the Klamath bridge will close one of the few remaining gaps in the Coast state highway between San Francisco and Portland, Oregon.

Putting the finishing touches on the Klamath River bridge

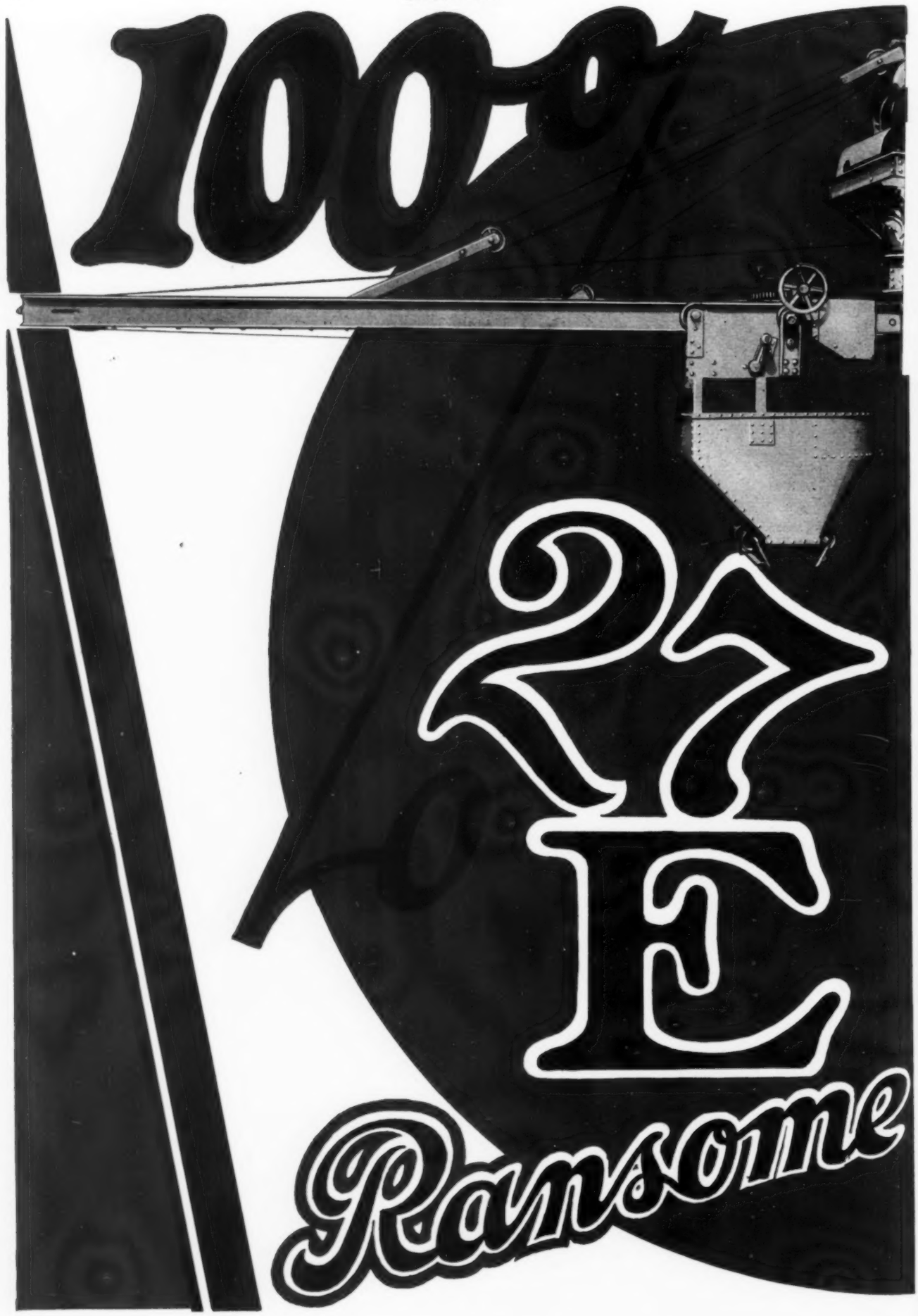
This tunnel will provide a subway for foot passengers under the River Spree near Berlin replacing an old ferry

Germans Build Subway Under the River Spree





These three photographs show various phases of the work and give a good idea of the arrangement for chuting the concrete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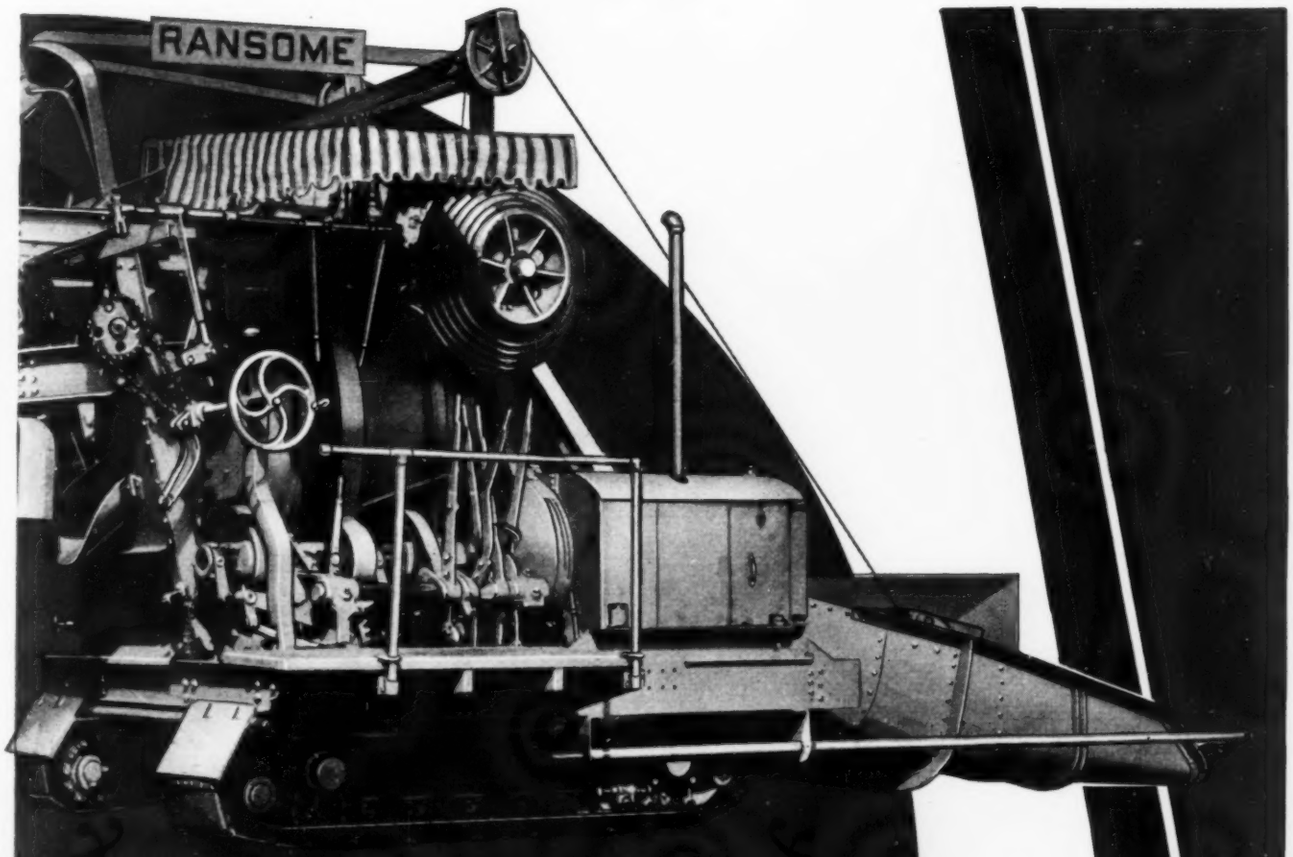

And it's a real 100% 27-E Paver too! The Ransome Paver's larger drum and larger engine mean greater yardage and fewer delays. Let us tell you where you can see one working.

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Paving Mixers

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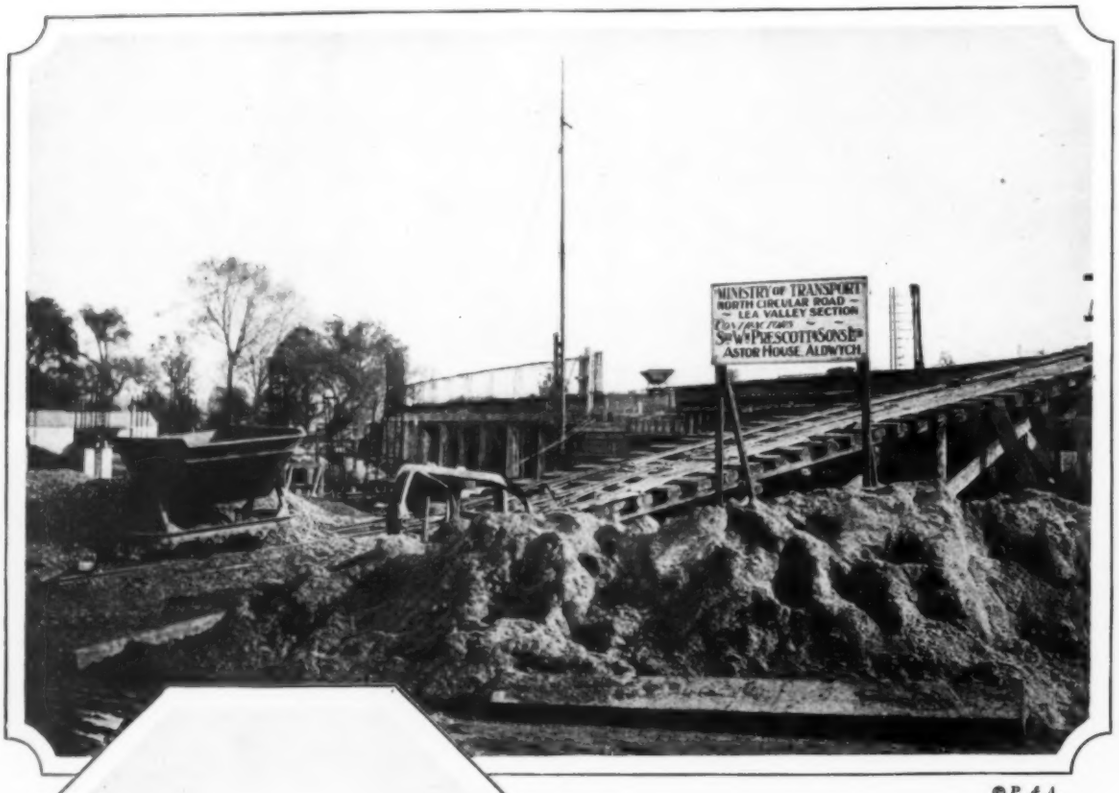
The Road Builders



Traffic congestion near London has made necessary the building of a new system of highways. This photograph shows one of the new roads under construction

© P. & A.

A seagoing highway near Key West Florida

© International.

Road building in Colorado is slow and tedious work. Five more miles of solid rock are ahead of the shovel in the photograph.

© Underwood & Underwood.

A new arrangement of DuPat scrapers hauled by a Cletrac working on an Ohio road

Show Their Wares

This paver owned by A. E. Ottaviano, Inc., of Croton, N. Y., has been laying 9-ft. concrete at the rate of 1,000 ft. per day on the Albany Post Road

The maintenance gang sets the styles on the highway

Modernizing A Cement Plant In Peru

Foundation Company Undertakes Reconstruction Program to Meet Increased Demand

THE manufacture of cement in Peru began about 6 years ago when the Peruvian Portland Cement Company opened the first cement plant in that country. This plant was situated in Lima, the capital, and had a capacity of 100 bbl. a day, although for various reasons the output was considerably less. The demand was not great and foreign cement was in common use.

As concrete construction began to increase and the demand for cement grew it became necessary to rebuild and enlarge the plant. This work was entrusted, some months ago, to The Foundation Company of New York, which is one of the largest users of cement in Peru, as it is engaged on a number of contracts with the government consisting of water supply, sewerage, paving and highway construction, and other construction including public buildings. A considerable amount of cement is also used in the Foundation Company's contracts with private companies.

To meet the rapidly growing demand coming from all sources in Peru for Portland cement of good quality, the Foundation Company is reconstructing its plant, still the only one operating in Peru, to a greatly increased daily capacity. Within a very short time the modernized and enlarged plant will be in full operation by a competent personnel, prepared, with their scientific methods of manufacture and complete up to date equipment, to furnish the Peruvian market with 500 bbl. daily of cement equal to the best foreign brands.

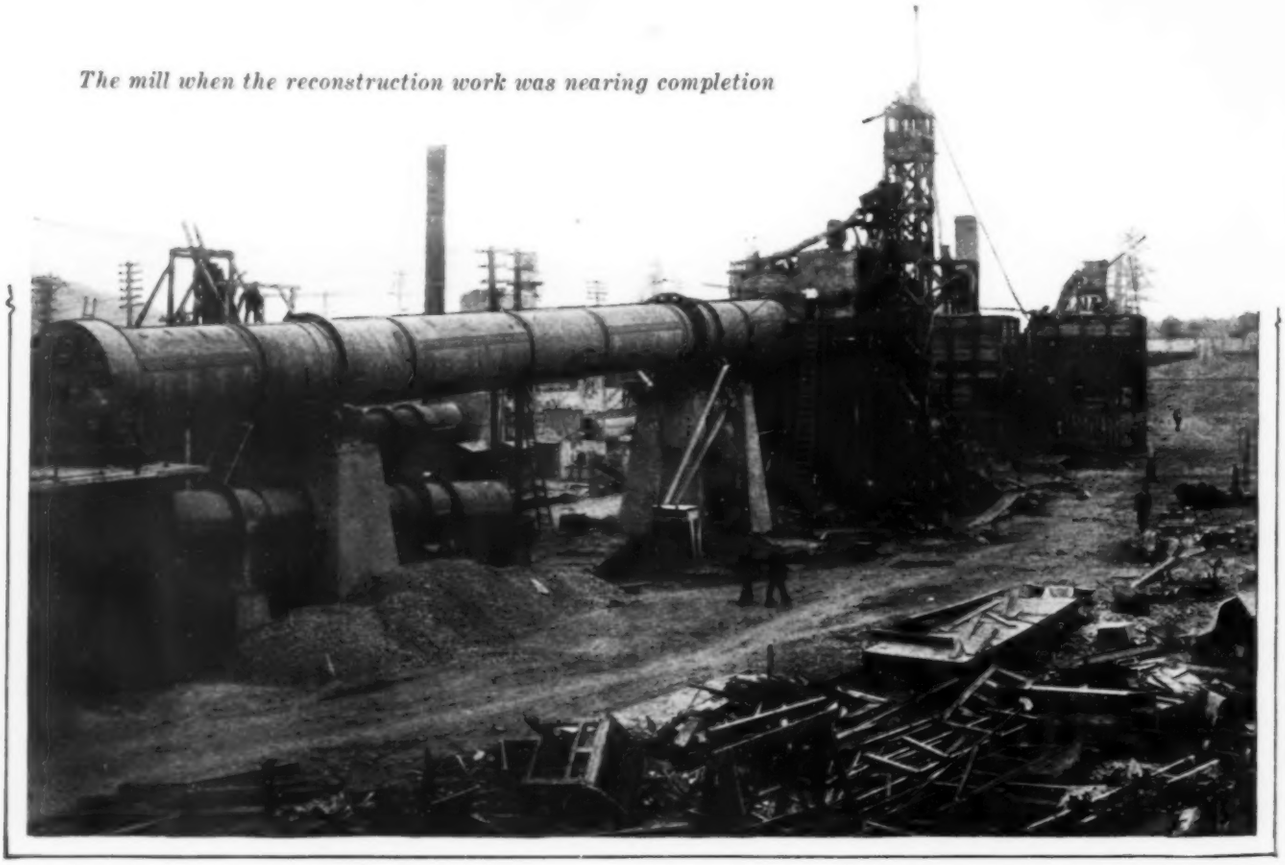
The modernization began at the quarries where drills operated by an air compressor were installed, and a daily output of 160 tons or more is produced. The stone is broken in a gyratory crusher and passed to a mill-hopper having a capacity of about 900 tons. From the hopper it is carried by gravity to specially constructed dump cars and transported to the plant where the cars are automatically dumped into a hopper whence the stone is carried to another storage hopper by means of a belt conveyor.

At each stage of the process, careful analysis is made in order to produce a final product of correct composition. In the storage hopper, the stone is sampled and analyzed and, to obtain a chemically correct combination, is mixed with proper proportions of clay, slaty schist and sand.

From the storage hopper, the stone is carried by a belt conveyor to the compeb mill where the stone is ground to a fine powder, 88 per cent of which must pass screens of 200 mesh to the sq.in. The pulverized stone is then carried by conveyors and elevators to a feed hopper from which are fed the kilns lined with refractory brick, especially insulated, and operated with oil fuel.

From the kilns, the clinker passes through coolers, where it is cooled to the proper temperature, to belt

The mill when the reconstruction work was nearing completion



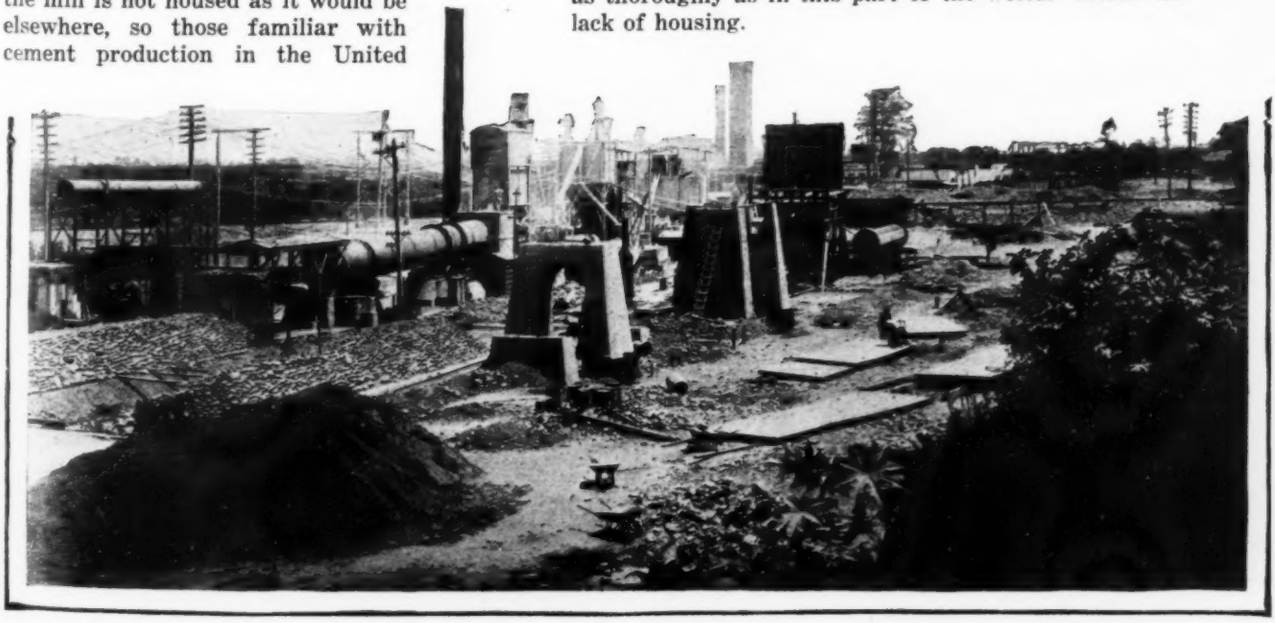
The three photographs on this page give a good idea of the general layout of the mill. The picture at the left shows it as it was when the Foundation Company took hold of it. The photograph just below and that at the bottom of the page both show different parts of the plant at the time when the job of rebuilding and enlarging it was in full blast.

conveyors and elevators which carry it to a weighing machine and to the clinker deposit; here a careful analysis is made and the right amount of gypsum added to regulate the setting.

From the clinker storage, the product is carried by belt conveyors and elevators to the tubular mills to be ground again; here also 88 per cent must pass screens of 200 mesh to the sq.in. and the product is automatically weighed.

From the ball mills it passes by spiral conveyors and elevators to storage where it is finally weighed before being bagged ready for delivery.

On account of the climate much of the mill is not housed as it would be elsewhere, so those familiar with cement production in the United States need not be alarmed by the open work construction shown in some of the accompanying photographs. It isn't necessary to protect machinery from the weather as thoroughly as in this part of the world. Hence the lack of housing.



Roadbuilding in the Jersey Meadows

Efficient Organization Makes Rapid Progress on Six Mile Grading and Drainage Job

ROADBUILDING across the Jersey meadows between the Hackensack and the Passaic Rivers never was an easy task, and it is one of the last places where really speedy work would be expected. Nevertheless, the H. Shapiro Construction Company of Albany, N. Y., is making remarkable progress on a 6-mile job between Rutherford and Hackensack. This road, when finished, will be an extension to the south of State Highway Route 17, which is a main route leading out of northern New Jersey into New York State. The present contract provides only for the grading and drainage of the new road, as no paving will be done until next spring, thus giving the fills time to settle.

The first work required by the New Jersey specifications is the plowing up of the entire surface of the right-of-way. This has proved to be an extremely awkward piece of work as the meadows are a mixture of heavy soil and water. In some places, it has been possible to do this plowing with a plow hauled by a Caterpillar tractor, but in many places, it was evident that the tractor would be bogged down and another method had to be adopted. Fortunately some old fills had been made at right angles to the new road, and it was possible to run a Mack truck out on these fills. Cable was then attached to the plow, and the winch on the truck used to pull the plow through the thick mud. The photographs at the bottom of page 35 show the character of the material that had to be plowed. A Fordson tractor was used to haul the plow back so that it could begin the next furrow. This plan, although it works well, is not a speedy process and is rather trying on the tempers of those engaged in it. Witness the agitation of the little group of men in the photograph at the top of page 34. They are trying to keep the plow on the straight and narrow path.

The Shapiro organization began work the first week in May and during the first month built about 18,000 yd. of fill. This fill varies in height above the surrounding meadow land from 7 to 2 ft. and averages about 4 ft. Borrow pits in the neighborhood, cellar excavations and any other surplus earth available have been used for the fill. The Shapiro organization has kept a fleet of at least 15 trucks moving all the time. Eight of them belong to the contractors and others are hired. At times as many as 21 trucks have been on the job.

Taking advantage of daylight-saving time and the fact that the work is being done at this season of the year, two shifts have been established, one working from 4 a.m. to 12:30 p.m. and the other from 12:30 p.m. until 9 p.m. It is dark when the morning shift begins, and Carbic lights are used for an hour or so.

A steady stream of trucks accounts for the rapid progress of the work

A grader is right at the heels of each truck as it dumps its load

It soon is light enough to dispense with them, however. The afternoon shift works in daylight throughout, as it is just getting dark at this time of the year at 9 o'clock. The men have half an hour off for lunch.

The photograph at the bottom of page 34 shows why such excellent progress has been made thus far. In that picture three trucks are shown arriving with their loads, only a few yards behind each other. The one at the right is dumping its load and the others will follow inside of a minute or two. This steady stream of trucks has been kept going ever since the work began and the best day's record was 396 truck loads of material deposited on the fill. At present one Weir grader and two Caterpillar tractors are on the job, but two more rollers will be at work soon. Only about 35 men are employed.

The photograph at the right tells its own story—a muddy one

The picture at the left shows the results of Shapiro's spring plowing

The superintendent in charge of the work is W. C. Shaw, and although the contract calls for the completion of the job in 136 working days, he expects to beat that time by a week or two. At present the job is ahead of schedule, although there have been several rainy days and even a comparatively light rain makes it impossible to work for several hours, and a heavy rain is likely to keep the men idle for a day or two. The nature of the soil is such that when it becomes water-soaked it is impossible to run the heavy machinery and trucks over the new fill. Under these conditions, the progress that has been made by the Shapiro company thus far is excellent and if the same pace is maintained in the next two or three months, the work should be finished well in advance of the first frost.

In addition to the grading, a number of temporary wood box culverts have been put in by the contractor and in a few places where it is possible to build permanent structures, some concrete pipe has been placed underneath the fill. In most instances, however, the temporary culverts have been necessary.

Who Reads Successful Methods?

HERE is a visible proof that the June issue of *Successful Methods* was read. The man on the right who is holding the magazine is Henry A. Hansen, superintendent of the 38th-48th St. section of the Eighth Avenue subway in New York which is being built by the Frederick L. Cranford-Charles H. Locher, Inc. organization.

This job was described in the June issue and Mr. Hansen is showing his own photograph to his friend and working companion of many years, Albert Armstrong who is employed on the same job. These two men have worked together on various construction jobs in every section of the country for more than twenty years. A year or two ago Mr. Armstrong decided that he would take a rest down in Florida but as soon as the subway was under way, Henry Hansen sent for him and he could not resist the temptation to get back to work. He packed his grip and took the first train for New York and Eighth Avenue.

If further proof is needed that Mr. Hansen read the June issue, it may be stated that he was the only man who noticed that in one place his contract was mentioned as extending from 38th to 40th Street instead of from 38th to 48th Street, thus lopping off about eight-tenths of his job. As *Successful Methods* has no desire to take away from Mr. Hansen any credit for the splendid job which he is doing in building a half-mile section of the new subway, the mistake is hereby corrected. This magazine is printed for men like Henry Hansen and Bert Armstrong who spend most of their time outdoors on construction work. They appreciate an opportunity to see photographs of work similar to theirs in all parts of the world. *Successful Methods* will fulfill its mission only if it earns the friendship of such men.

Bert Armstrong

Henry Hansen

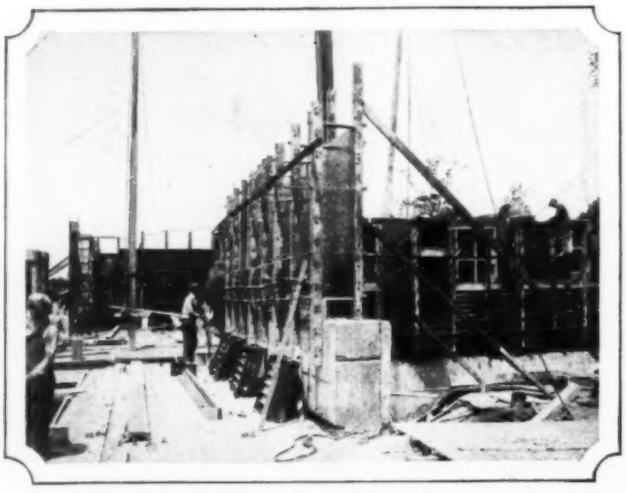
Paving a Texas Highway

THE Texas Highway Department recently completed a 35-mile link in State Highway No. 1, which runs from Texarkana on the east to El Paso on the west, a distance of about 900 miles. This work was done in Palo Pinto County between Mineral Wells and Strawn. The upper photograph on this page shows the new road under construction. It consists of a 2-in. asphalt wearing surface laid on a 9-in. compacted sledged stone foundation. Local limestone was mixed with Texaco asphalt to form the wearing surface. The stone for the base also was obtained locally. The lower photograph shows a curve in the finished road. The pavement is 18 ft. wide and is designed to carry heavy traffic as it is on the route between the cities of Dallas and Fort Worth and the oil fields of Breckenridge, Eastland and Ranger. The contractors on this section of the highway were Smith Brothers, Inc., of Dallas. Guy R. Courter, now of the State Highway Department, was the engineer.

Bond Issue Proceeds Spent for Hospitals

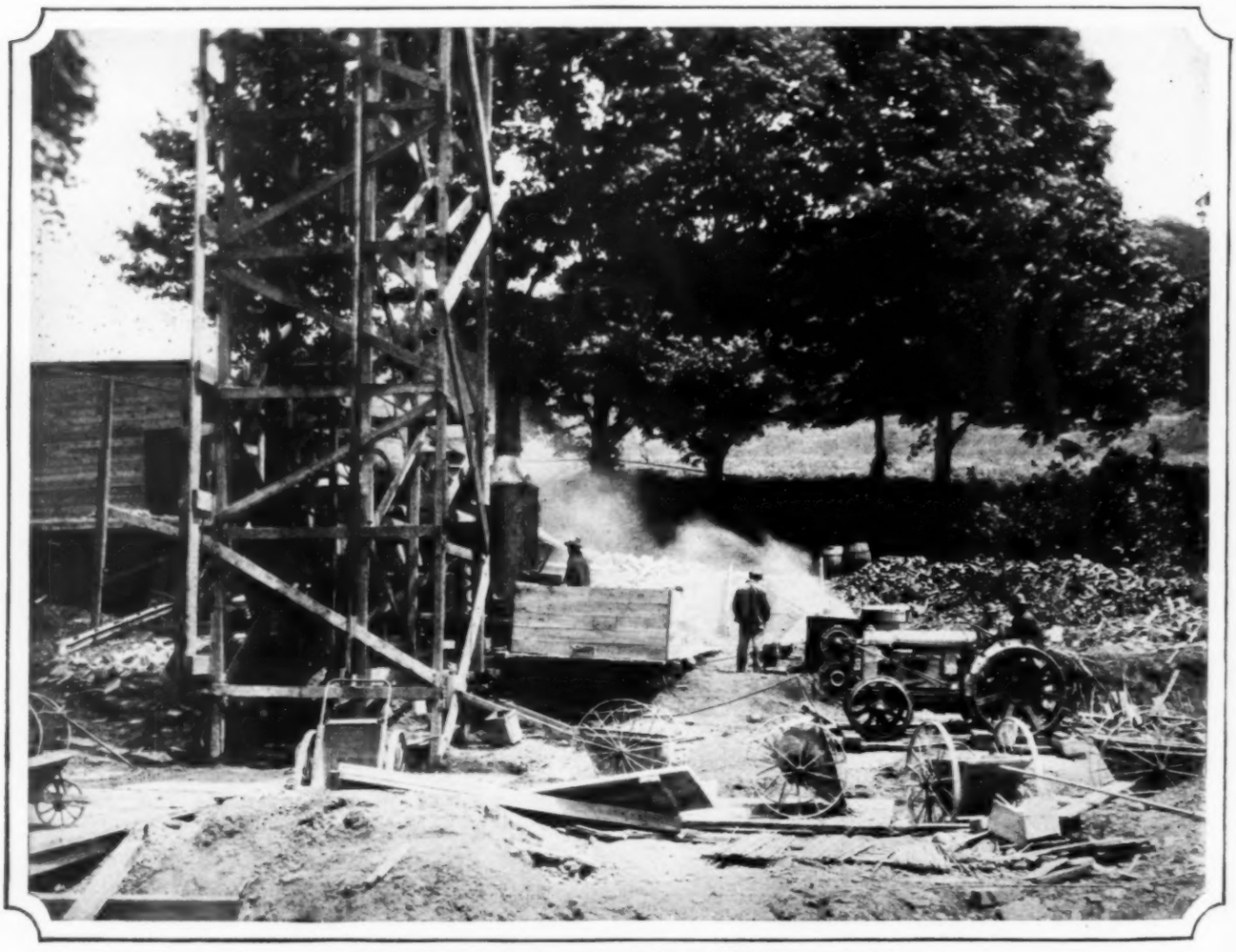
New York's Big Program Well Under Way—Six New Buildings Going Up at Wingdale

WHEN the people of the State of New York were asked to pass a bond issue last fall which would provide $10,000,000 a year for 10 years, they were told that as soon as the first money was available, it would be spent for the purpose of enlarging and improving the state hospitals and asylums. The photographs which accompany this article show that construction work is well under way at the Harlem Valley State Hospital at Wingdale where six fire-proof buildings and three doctors' cottages are being put up. These will house about 1,500 persons who are in such condition that they must be taken care of by the state. Similar work is going on at other state institutions.



Steel forms are used

At Wingdale, the Feeney & Sheehan Building Company, contractors, of Albany, N. Y., are putting up the new buildings, and they have put one of the biggest men in the construction field in charge of the job. He is J. W. Bell, whose photograph is shown on page 39, and although exact specifications are not available, it is safe to say that he is about 6 ft. 3 in. in height and is no longer on speaking terms with the 200-lb. weight on the scales. Mr. Bell has been in the construc-



A Fordson furnishes power for chuting tower hoist

On the Wingdale job. The brick storage chute is shown at the bottom of the page with one of the towers and J. W. Bell, the superintendent, above

tion game a long time but he is always discovering some new way to handle the various problems which come up in connection with the job. At Wingdale he is operating his concrete bucket in his chuting tower with a Fordson tractor. The large photograph at the bottom of page 38 shows this outfit in operation.

Another interesting piece of equipment at Wingdale is the brick storage chute which is shown at the bottom of the group of photographs on page 39. This chute was not quite finished when the photograph was taken. It is designed so that brick can be unloaded from freight cars with a derrick and then dumped directly into motor trucks.

Steel forms are being used wherever possible on the job and the way in which they are being handled is shown in the small photograph at the top of page 38.

Work began at Wingdale a few days after the contract was awarded, and it is expected that the buildings will be ready to be turned over to the state in July of next year.

Portable Compressor Makes Good in Bermuda

Competes Successfully With Cheap Labor Despite High Price of Gasoline

THE question of whether a job is to be done by hand labor or by machine often is decided by the cost of labor in that particular locality at the time. Where labor is cheap a young army of men frequently may be found doing jobs that a machine could handle comfortably. And if the labor is cheap enough, there is considerable justification for keeping to the old-fashioned hand methods.

When in addition to competing with cheap labor, a machine also is handicapped by the fact that the fuel needed to run it is usually expensive, the machine hasn't much chance of getting the job. Down in Bermuda labor can be had for about 28 cents an hour and gasoline costs about 50 cents a gallon. Automobiles are not permitted on the island and this lack of demand plus the fact that the islands are about 600 miles from the nearest mainland keeps the price of gasoline high.

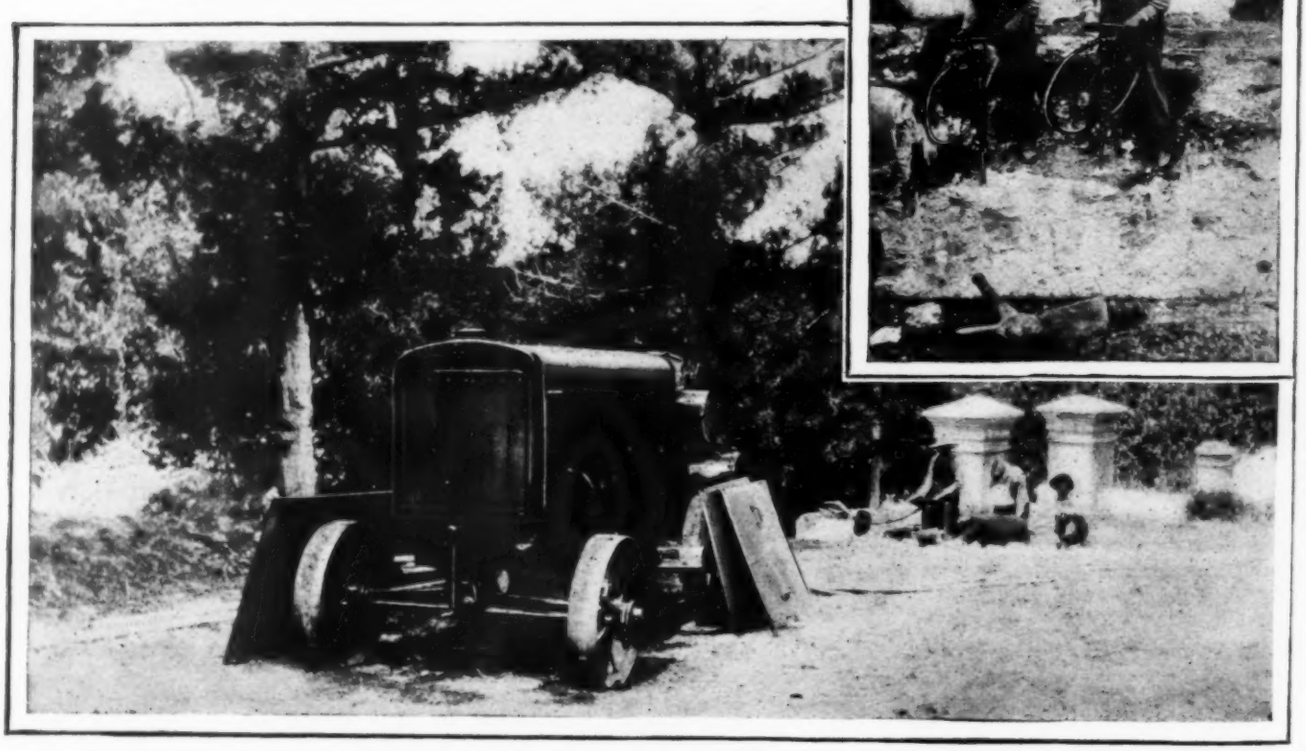
Nevertheless E. N. H. Jones, Director of Works of the Colonial Government who is in charge of road construction and maintenance and other branches of public works, has found that compressed air equipment can be used with profit. About two years ago, an Ingersoll-Rand portable compressor was brought to Bermuda and has been used since then operating air tools in the quarries on the island. This machine worked so well that a second portable compressor has been purchased and is being used in road work in various parts of the colony.

The photographs on this page show the new compressor supplying air for a job in Warwick Parish. The men shown in the small photograph are engaged in drilling through limestone rock in order to provide a new flight of steps for a building which had been deprived of its old access to the highway by road widening operations which also were accomplished with the compressor and air tools.

The success of the two compressors now in use despite the cheap labor and the high cost of fuel show pretty well that machines can perform work profitably even under conditions that at first would seem to be most favorable to the use of hand labor.

On the other hand, on the very day the photographs on this page were taken, a gang of men were hard at work not more than half a mile away laboriously chopping out with hand tools a new green for the Riddell's Bay golf course. They took a couple of weeks for a job which the compressor and air tools could have done in as many days. All of which would tend to prove that not everybody on the Bermuda Islands is as wide awake to the possibilities of modern construction machinery as the able Director of Works.

Cutting coral rock with air tools



Cranes Save Money on Docks

Motor Truck Mounting Makes It Possible to Use Them Where There Is No Permanent Unloading Apparatus

UNLOADING problems have always been important factors in calculating the cost of material handling. The distances that materials are carried either by train or by boat is unimportant from a cost standpoint when compared with the cost of getting them in or out of the cars or vessels in which they are transported. The unloading of boats presents problems that vary greatly. In coast-wise cities the tide is a factor that always has to be considered, while in the lake cities, such as Chicago, Milwaukee, Duluth, and Detroit, this factor is absent.

In the larger cities all sorts and conditions of docks are found. Some will be equipped with elaborate loading apparatus while others will be destitute of any means of handling the materials that are brought alongside. The latter type of dock is encountered far too often and the man who is bringing in his materials by water must be ready to get them unloaded no matter to what type of dock his boat is moored. This means that he must have mobile equipment that can unload a barge of coal at one dock on Monday, and on Tuesday be at the other end of the city ready to handle a barge load of stone.

At this sort of work, Universal cranes mounted on motor trucks have proved their usefulness wherever water transportation of bulk materials is used. They can handle large quantities of materials with clamshell buckets and their motor truck mounting makes it easy to get them from one place to another with the minimum of delay.

In various ports throughout the country, prominent among them being New York, Baltimore and Los Angeles, the mobility of the motor truck mounted cranes is being used to advantage on such work. These cranes are used to unload various materials at the dock such as coal, miscellaneous boxed freight, heavy machinery, etc.

In New York a large part of their dock unloading work is unloading barges of coal. The photograph at the bottom of this page shows two of the three Universals of the United States Trucking Corporation being used for this purpose.

No exact figures are available on these New York City jobs but an idea of the efficiency of the crane can be obtained from some barge unloading work done recently at Buffalo, where a Universal was unloading barges of sulphur, dropping the bucket into the hole of the barge 10 ft. below the dock and hoisting it 12 ft. above the dock (a total hoist of 22 ft.) and swinging the bucket through 110 degrees to dump into trucks. The crane regularly handled 10 to 12 buckets every

This pair of cranes unloads coal barges in New York

At right—Equipped with a magnet, crane handles scrap iron at Spanish seaport

Below—Another coal handling job direct from barge to motor truck

5 min., averaging 3 to 4 min. each loading time for 40 trucks. Between 8 a.m. and 4:30 p.m. 300 tons of sulphur were unloaded.

In Baltimore the Western Maryland Railroad's Universal is reported as unloading 1 car of potash, 2 cars of sheet iron and 8 cars of rails from lighters to dock in 9 hr.

The Smith Bros. Trucking Co., of Los Angeles, has two Universals handling heavy machinery on the Wilmington docks. On one contract 25,000 tons of plate steel for a 10,000,000-ft. gas holder were handled on the docks by the cranes, which loaded it into trucks.

Over in Spain, Universals are used on the docks for unloading. The crane in the smaller photograph on this page is equipped with a 36-in. electric lifting magnet, excited by a generator mounted on the crane, belt driven by the crane engine. This crane replaced 15 hand laborers unloading a number of barges each holding 95 tons of scrap.

After loading trucks with heavy machinery on the dock the mobility of the crane enables it to follow the loaded trucks to the job and unload them. In many cases where trailers are used the expense and time of a hauling truck is saved by using a Universal to haul the loaded trailer from the dock to the job, where the crane again unloads the material.

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